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# SPECIAL REPORT ON THE NEED FOR ELECTRICAL CAPACITY

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SELECT COMMITTEE ON  
ONTARIO HYDRO AFFAIRS

The Legislative Assembly of Ontario  
3rd Session. 31st Parliament  
28 Elizabeth II, 1979

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DECEMBER, 1979



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# SPECIAL REPORT ON THE NEED FOR ELECTRICAL CAPACITY

SELECT COMMITTEE ON  
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The Legislative Assembly of Ontario  
3rd Session. 31st Parliament  
28 Elizabeth II, 1979

DECEMBER, 1979

TO: THE HONOURABLE J.E. STOKES  
Speaker of the Legislative Assembly of the Province of Ontario

Sir: On behalf of the Members of the Select Committee on Ontario Hydro Affairs appointed by the Legislative Assembly of the Province of Ontario on November 24, 1977, to inquire into various matters relating to Ontario Hydro, I have the honour of submitting the attached report.

Donald C. MacDonald  
Donald C. MacDonald, M.P.P.  
York South  
Chairman



SELECT COMMITTEE ON  
ONTARIO HYDRO AFFAIRS

SPECIAL REPORT ON  
THE NEED FOR ELECTRICAL CAPACITY

THE LEGISLATIVE ASSEMBLY OF ONTARIO  
THIRD SESSION: THIRTY-FIRST PARLIAMENT  
28 Elizabeth II, 1979

MEMBERS

Donald C. MacDonald, M.P.P., Chairmain	York South
Jim Foulds, M.P.P., Vice Chairman	Port Arthur
George Ashe, M.P.P.	Durham West
J. Albert Belanger, M.P.P.	Prescott-Russell
Sean G. Conway, M.P.P. *	Renfrew North
Sam L. Cureatz, M.P.P. *	Durham East
Evelyn Gigantes, M.P.P.	Carleton East
Ray Haggerty, M.P.P.	Erie
Mickey Hennessy, M.P.P.	Fort William
Nicholas G. Leluk, M.P.P.	York West
Bob Mackenzie, M.P.P. *	Hamilton East
Robert F. Nixon, M.P.P.	Brant-Oxford-Norfolk
Julian Reed, M.P.P.	Halton-Burlington
John Williams, M.P.P.	Oriole

STAFF

Counsel	Alan M. Schwartz <i>Siegel, Fogler Barrister and Solicitors</i>
Consultant	James D. Fisher <i>The Canada Consulting Group</i>
Clerk of the Committee	Andrew Richardson

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\* - Mr. Cureatz replaced Mr. McNeil on April 17, 1979;  
Mr. Conway replaced Mr. Kerrio on May 31, 1979;  
Mr. Mackenzie replaced Mr. Di Santo on June 19, 1979.



SPECIAL REPORT ON THE NEED  
FOR ELECTRICAL CAPACITY

SPECIAL REPORT ON THE NEED  
FOR ELECTRICAL CAPACITY

as Chairman of Standing Committees on several subjects relating to the  
development of electric power. The Committee's specific areas of reference  
are indicated in the following:

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SPECIAL REPORT ON THE NEED  
FOR ELECTRICAL CAPACITY

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The Select Committee on Ontario Hydro Affairs was established by the Legislative Assembly of the Province of Ontario on November 24, 1977 with Mr. Donald C. MacDonald, M.P.P. (York South) as Chairman, to examine and report on several matters relating to the activities of Ontario Hydro. The Committee's complete terms of reference are Appendix A to this report.

The Committee determined that, before looking at the specifics of Ontario Hydro's generation expansion program and Ontario's commitment to nuclear power, it should come to its own conclusions on the probable need for electricity over the next twenty to twenty-five years. Accordingly in eight weeks of January and February of this year, the Committee had an extensive series of hearings into the demand for electricity. In that eight weeks the Committee heard and questioned expert testimony on each of the important factors that will determine the future demand for electricity: our growing population; long-term economic prospects; the changing industrial structure; prospects for alternative conventional and non-conventional energy sources; and the promise of conservation. In addition, the Committee discussed several comprehensive energy projects for Canada and Ontario to assess how energy planners at the Federal level, in independent research organizations, from conservation groups, and the Ministry of Energy combined the various factors to produce projections of overall energy growth and the particular place of electricity in the future. The chronology of the hearings is set out in Appendix B and the complete list of witnesses is included in Appendix C. With this extensive background, the Committee was able to make an informed assessment of Ontario Hydro's growth forecast and to arrive at its own conclusions. This report sets out very briefly the Committee's main conclusions. A more complete summary and synthesis of the evidence is found in Appendix D, the transcript of the Committee's final discussion of the evidence and in Appendix E, the slides used by the staff in the summary presentation. Appendix F is the list of exhibits tabled with the Committee throughout this period.

Ontario Hydro is expecting that the growth in demand for electrical energy will be lower in the future than it has been in the past. From 1920 until the mid-seventies, the growth in demand for

electricity averaged about 6.8% per annum and never deviated very far from the average. In late February, 1979, Ontario Hydro forecast a gradual slowing in the growth of demand to an average annual growth of about 5.0% to 1985; 4.9% to 1990; 4.5% to 1995; and 4% to the year 2000.

The Committee believes that the growth in demand for electricity is not likely to be as rapid as Hydro has forecast. Further, the Committee believes that given the uncertainties of long range energy planning, it would be prudent to develop generation expansion programs that are applicable to a range of possible growth patterns, rather than to choose one number for the peak demand in a future year and build to that single estimate.

The consensus of the Committee is that the Government of Ontario and Ontario Hydro should be planning for a load growth that will average between 2% and 3% per annum between now and 2000. This load growth is substantially less than that experienced in the past, but is still sufficient to provide for more electricity for every person living in Ontario than there is to-day. Reduced load growth will result from the following underlying changes:

- Population growth in Ontario will be less than it has been in the past because of lower fertility rates (smaller families) and lower net migration (fewer people are immigrating to Ontario from other countries and provinces, possibly more people are leaving Ontario for other provinces -- principally in Western Canada.)
- Economic growth is not likely to be as high as it has been in the past. The Committee is not expecting continuing recessions or even continuing stagnation of the economy: Our current problems will be overcome.

However, as the growth in the labour force declines and the opportunities for productivity improvements diminish in a service-oriented economy, the annual growth in the economy will average about 3½% as opposed to post-war levels of 4½% and 5%.

- o Overall energy growth will also slow. Part of the slowing in energy growth is the result of the slowing in population and economic growth described above. The responses to growing shortages of conventional energy and to higher prices that come under the general heading "conservation" account for another part of the slowing in energy growth rates. In the past, it had been assumed that energy growth had to parallel -- or even exceed -- economic growth. Now this view is no longer widely held. The World Energy Conference detected signs that, as an economy matures, energy growth need not be high to sustain economic growth. Further, as energy prices rise and supplies decline, ways must be found -- and are being found -- to sustain economic growth rates with lower energy growth rates. In this regard, the Committee's own position matches that of the Ministry of Energy: the average annual growth in overall energy consumption need not exceed 2% per annum and Government policy should be directed to this target.
- o Alternate energy supplies to the Province of Ontario will change over the next twenty

to twenty-five years: oil will not be as abundant as it has been in the past; gas supplies should be adequate; coal should retain its current markets; and higher energy prices will create an umbrella that will permit the development and introduction of a variety of alternative technologies from waste conversion to solar heating.

There are many possible ways of combining the four variables listed above. The Committee examined the assumptions of each of the energy planning groups that came before it, of the National Energy Board and of the recent policy position of the Minister of Energy before arriving at its own conclusion. WITH OVERALL ENERGY GROWTH IN THE PROVINCE AVERAGING ABOUT 2% PER ANNUM TO THE YEAR 2000, THE GROWTH IN DEMAND FOR ELECTRICITY SHOULD FALL IN THE RANGE OF 2% to 3%.

The Committee is aware that the advocated planning range has serious implications for the current generation expansion program. Hydro has underway, at this time, a very substantial construction program that will, when completed, add another 10,000 megawatts of capacity to the current 23,000 megawatt system. Over 80% of the capacity under construction is nuclear. As it takes many years to construct a nuclear generating station, the station on which the least work has been done -- Darlington -- is expected to have its four units come into service in 1988, 1989 and 1990. However, at a 2% to 3% growth in demand, the Darlington station will not be required until between 1996 and 2004. In addition, with a forecast growth of between 4% and 5%, Hydro is expecting to add three to six plants to the system after Darlington. At a 2% to 3% growth rate, no further expansion beyond Darlington is required to the turn of the century.

One particular concern is that with this long-term surplus capacity, Ontario Hydro may be encouraged to be less concerned about conservation. Already the conservation advertising program has been altered.

The wisdom of maintaining the load management programs during a period of generating surplus is being questioned. It would be extremely short-sighted to break the momentum of conservation programs that will ultimately benefit all society but take an extremely long time to build in order to use up a short-term surplus of electrical capacity.

The Committee is aware and concerned, however, about the very serious implications on the provincial economy and on Ontario Hydro of a load growth of only 2% to 3% per year. Hydro's construction program is a very significant factor in total provincial employment. The most apparent implication is that the construction at Darlington should be deferred or stretched out even further. But the situation may not be that simple. It is possible that Darlington should be built just to replace one of the older plants on the system that burns one of the fossil fuels. It may be that the construction schedule should be maintained to hold jobs in the current, depressed economic circumstances, or to keep the nuclear industry from complete collapse, or just to provide "insurance" against other energy problems.

The Committee has not analyzed any of these options in detail, nor, in the time it has available, should it. The Committee believes that its responsibility is to bring to the Legislature the results of its intensive analysis of energy demand in Ontario and the very serious implications of this analysis for the construction program of Ontario Hydro. The Government must not allow the current construction program to drift along with further commitments being added to the nearly \$700 million in contracts already awarded for Darlington, until the Government has studied and can report to the Legislature on the implications of a 2% to 3% planning range for growth in electricity.

The Committee recommends that:

*RECOMMENDATION:*

*THE GOVERNMENT OF ONTARIO INFORM ONTARIO HYDRO THAT NO ADDITIONAL CONTRACTS FOR THE CONSTRUCTION OF THE DARLINGTON GENERATING STATION BE AWARDED UNTIL THE GOVERNMENT HAS REPORTED TO THE LEGISLATIVE ASSEMBLY ITS POLICY FOR THE CONSTRUCTION OF ADDITIONAL GENERATING CAPACITY IN ONTARIO.*

DISSENTING OPINIONS OF  
THE PROGRESSIVE CONSERVATIVE MEMBERS  
OF THE SELECT COMMITTEE ON ONTARIO HYDRO

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The Members of the Select Committee from the Progressive Conservative Party (Messrs., Ashe, Belanger, Cureatz, Hennessy, Leluk, and Williams) wish to submit the following dissenting opinions on "The Need for Electrical Capacity".

The Progressive Conservative members did not, and do not agree that the report as written should be tabled in the Legislature. Instead, we believe that the Report should be tabled at the Committee in the winter session of hearings commencing in January, 1980. The reasons for this position are as follows:

1. Incomplete Information

o In January and February of 1979, the Committee members heard extensive testimony from a range of witnesses on the demand for electricity. The view of the Conservative members is that before the Select Committee can come to conclusions on the need for electrical capacity, (as suggested by the title of the report) it must also hear evidence pertaining to energy supply. As pointed out in the Majority Report, decisions affecting the capacity of Ontario Hydro's system must involve many other factors besides the load forecast.

o It should also be noted that three members presently sitting on the Committee were not part of the original in-depth discussions on the demand for electricity and therefore did not hear the evidence. In the last minute rush by a majority of the Committee to table the "Special Report on the Need for Electrical Capacity" it is highly unlikely that the three members indicated had time to review, in any detail, the previously submitted evidence.

- o Given that a number of important issues have not been properly addressed, such as to name a few, the uncertainty of oil supply and relative pricing, (nationally and internationally), the significant potential for inter-fuel substitution, and very important system planning factors such as transmission limitations, the Conservative Members question the Majority conclusion that "the growth in demand" for electricity should fall in the range of 2% to 3%.

2. Uncertainty in Forecasts

There is a great deal of uncertainty about any load forecast, particularly in these "energy uncertain" times. We believe because of the uncertainty involved, it would be more prudent to consider a range of 2% to 4%.

- o Ontario Hydro is now in the process of re-assessing its construction schedule in light of the load forecast and other considerations, leading to a decision early in 1980 when the new forecast will be available. This decision, and the planning for an electrical system in light of that forecast, is the responsibility of the Ontario Hydro Board.

- o The final report of the Royal Commission on Electric Power Planning is also expected early in the new year.

- o Therefore, it is premature to place this matter before the Legislature at this time. The Committee should examine the issue of need for electrical capacity when updated information and analysis is available and when the Committee has examined the supply side of the equation.

3. Maintaining Continuity of Hydro Contracts

- o The importance of maintaining the flow of contracts should not be ignored. The implication of a disruption in contracts would amount to a deferral in construction schedule. Such a decision should be made only by the Board of Ontario Hydro with full information and its implications.

SUMMARY

As indicated in the Majority Report, members are:

"aware and concerned, however, about the very serious implications on the provincial economy and on Ontario Hydro of a load growth of only 2% to 3% per year. Hydro's construction program is a very significant factor in total provincial employment. The most apparent implication is that the construction at Darlington should be deferred or stretched out even further. But the situation may not be that simple. It is possible that Darlington should be built just to replace one of the older plants on the system that burns one of the fossil fuels. It may be that the construction schedule should be maintained to hold jobs in the current, depressed economic circumstances, or to keep the nuclear industry from complete collapse, or just to provide "insurance" against other energy problems.

The Committee has not analyzed any of these options in detail, nor, in the time it has available, should it."

The Conservative Members believe the responsibility of the Committee is to present findings and recommendations only after it has had an opportunity to assess all these factors. To propose a 2% to 3% average annual load growth range, without taking these factors fully into account, is, in our view, irresponsible.

It is the opinion of the Conservative Members that it is particularly inappropriate for the Committee to make a specific recommendation to halt the letting of contracts on Darlington. This is only one of the several generating stations under construction.

The Legislature has assigned the responsibility for entering into contracts to the Hydro Board of Directors and Hydro Management. It is the Board, then which should decide, with all information before it, on the nature and timing of new contracts relating to Darlington, or for that matter, any other generating station previously given approval by the Lieutenant Governor in Council.

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APPENDIX A

TERMS OF REFERENCE

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APPENDIX A

TERMS OF REFERENCE

On motion by Mr. Welch, seconded by Mr. Kerr,

ORDERED, That a Select Committee of the Legislature be appointed:

First, to inquire into the cost of construction of the two heavy-water plants being built by Ontario Hydro at the Bruce Nuclear Power Development, and report to the Legislature on all factors affecting cost, such examination to include but not be limited to:

- (a) The requirements for heavy water, the original estimates of the cost of the plants and the contract signed with the Lummus Company of Canada for the construction of the plants and the conditions placed on the contracts for Canadian content;
- (b) The change in the scope of the work required due to changes in plant design after the original estimates were completed;
- (c) The effect on the total cost of the plants and their construction schedule due to the cancellation of the fourth plant known as plant "C";
- (d) The factors affecting any additional costs incurred by the contractor and Hydro for the supply of major equipment, structural components or other supply items;
- (e) The factors affecting escalation of sub-contracts placed by the contractor, or Hydro for work related to the construction of the plants;
- (f) The factor affecting labour costs for construction of the plant including escalation of labour rates, work stoppages, union jurisdictional disputes, and the shortage of any labour skills required for construction;
- (g) The effect of interest rates, and foreign exchange rates on the overall costs of construction;
- (h) The administration of the contract by Hydro and the control methods used to monitor and minimize the cost,

and to prepare and submit a report for the Legislature upon the conclusions of this inquiry.

Second, to review the implementation of the recommendations of the Select Committee of the 30th Parliament which examined Ontario Hydro's proposals for bulk power rate increases for 1976; such review to include consideration of Ontario Hydro's status reports tabled by the Ministry of Energy.

Third, to examine Ontario's nuclear commitment, taking into account the report and recommendations of the Royal Commission on Electrical Power Planning and Ontario's Energy Future, such examination to include but not be limited to:

- (a) Ontario Hydro's system planning strategy for adopting nuclear power and, in particular:
  - o Large v. small generating stations;
  - o Remote stations v. sites close to urban areas;
  - o The ratio of nuclear-fuelled generating stations that should be built in comparison to fossil fuelled stations, keeping in mind security of supply and cost differentials;
- (b) The economics of nuclear power v. generation from other primary fuels;
- (c) The performance and reliability of nuclear generating stations;
- (d) The responsibility for, and the standards relative to the safety of nuclear generation stations;
- (e) Environmental impact and health considerations related to nuclear power.

And that the Select Committee may prepare and submit interim reports for the Legislature and shall prepare and submit a final report before the end of December, 1978, and that the Select Committee may request such coverage of its proceedings by Hansard and the printing of such papers as the Committee deems appropriate; and the Committee shall have authority to sit during the interval between sessions and have full power and authority to employ counsel and such other personnel as may be deemed advisable and to call for persons, papers and things, and to

examine witnesses under oath and the Assembly doth command and compel attendance before the said Select Committee of such persons and the production of such papers and things as the Committee may deem necessary for any of its proceedings and deliberations, for which the Honourable Speaker may issue his warrant or warrants; and the Committee shall be composed of 14 members as follows: Mr. MacDonald (Chairman), Ashe, Foulds, Gigantes, Haggerty, Handleman, Jones, Kerrio, Lane, Leluk, Nixon, Reed (Halton-Burlington), Samis, and Williams\*.

\* - Messrs. Handleman, Jones, Kerrio, Lane and Samis were subsequently replaced by Messrs. Belanger, Cureatz, Conway, Hennessy, and Mackenzie.



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APPENDIX B

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LIST OF WITNESSES

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APPENDIX B

LIST OF WITNESSES APPEARING BEFORE THE SELECT COMMITTEE ON ONTARIO HYDRO AFFAIRS

HEARING INTO THE NEED FOR ELECTRICAL CAPACITY

*Ministry of Energy*

M. ROWAN	Deputy Minister of Energy
DR. I.H. ROWE	<i>Executive Co-ordinator, Conservation and Renewable Energy Group</i>
DR. R.M. HIGGINS	<i>Senior Adviser on Renewable Energy, Conservation and Renewable Energy Group</i>
J.F. ORGILL	<i>Adviser on Solar Energy, Conservation and Renewable Energy Group</i>
P.E. PINNINGTON	<i>Acting Executive Co-ordinator, Conventional Energy Group</i>
T. CHAMPION	<i>Senior Adviser on Coal and Uranium Policy Development Group</i>
D.A. DEAN	<i>Senior Adviser on Crude Oil, Policy Development Group</i>
R. LUNDEEN	<i>Policy Co-ordinator on Electric Power, Conventional Energy Group</i>
P. SIMON	<i>Senior Adviser on Hydro, Policy Development Group</i>
J.W. NEWTON	<i>Acting Executive Co-ordinator, Strategic Planning and Analysis Group</i>
G.A. DOMINY	<i>Senior Analyst, Strategic Planning and Analysis Group</i>
W.O. HARPER	<i>Analyst, Strategic Planning and Analysis Group</i>

*The Ministry of Industry and Tourism*

R.J. MIFFLIN	Executive Director <i>Policy and Priorities Division</i>
R.P. HILL	Senior Policy Adviser <i>Policy and Priorities Division</i>
F. KUTAS	Senior Economist, <i>Policy and Priorities Division</i>
S. LAU	Economist <i>Policy and Priorities Division</i>

*The Ministry of Treasury and Economics*

D.B. TULLY	Director, <i>Economic Policy Branch</i>
DR. C.B. JUTLAH	Senior Policy Adviser <i>Economic Policy Branch</i>
O.M. SCHNICK	Executive Director <i>Central Statistical Services</i>
(MRS) H. SALISBURY	Manager of Social and Economic Data Unit <i>Central Statistical Services</i>
R.K. KOGLER	Economist in Social and Demographic Unit <i>Central Statistical Services</i>

*Ontario Hydro*

R.B. TAYLOR	Chairman
D.J. GORDON	President
M. NASTICH	Executive Vice-President, <i>Planning and Administration</i>
A. NIITENBERG	Vice-President, <i>Power Systems Program</i>
DR. D.A. DRINKWALTER	Chief Economist
L.T. HIGGINS	Manager, <i>Utilization Forecasting</i>
D. CODE	Manager of Customer Application Department <i>Energy Conservation Division</i>

L.V. SKOF

Manager of Marketing Research

G.H. WEST

Manager of Load Management Department

*Statistics Canada*

DR. D. NORRIS

Statistical Analyst,

*Population Estimates and Projections Division*

*Science Council of Canada*

DR. J.M. GILMOUR

Director of Research

E.R.Q. STOIAN

Science Adviser

*Economic Council of Canada*

J. GANDER

Co-author,

*Report on The Long-Term Energy Assessment Program, prepared for Energy, Mines and Resources Canada*

*Energy Resources Conservation Board, Alberta*

N.J. DUNCAN

Senior Mining Engineer of Coal Department

F.J. MINK

Manager of Economics Department

*Town of Atikokan*

J. PIERCE

Reeve

W. CALDER

Chairman of Atikokan Hydro

*Town of Newcastle*

K. BARR

Acting Mayor

J. HOLLIDAY

Councillor

W. PARK

Councillor

*Town of Port Elgin*

I. JAMIESON

Mayor

### Bruce County

A. SPEAR Warden

### *Bruce Economic Development Committee*

G. HARRON Chairman  
(former Warden of Bruce County)

## Scarborough Public Utilities Commission

J. CURTIS General Manager

## World Energy Conference

DR. J.S. FOSTER Vice-Chairman,  
*Conservation Commission*

Other Witnesses (alphabetically by Organization)

Canadian Petroleum Association

H.E. BAUGH Chairman  
Board of Governors

H. MACIEJ Technical Director

I. SMYTH Executive Director

Data Resources Inc.

W.E. EMPEY Manager of Canadian Forecasting

## The Electrical and Electronic Manufacturers Association of Canada

H. KLUGE Chairman,  
(President, Ascolectric Limited)

D.E.P. ARMOUR President and Chief Operating Officer

D.F. ABEL Vice-President, Strategic Planning and Review  
(Canadian General Electric Company Limited)

D. OLIVER Manager, Corporate Planning and Development  
(Philips Cables)

S. RAJ Manager, Statistics and Economic Information

*Energy Probe*

DR. D.B. BROOKS	Co-ordinator, Ottawa Office
C. CONWAY	Policy Research, Toronto Office
R. CROW	Adviser and Consultant
B. MARSHALL	Policy Research, Toronto Office

*Friends of the Earth*

A.B. LOVINS	Consultant Physicist, British Representative
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*Informetrica Ltd.*

M.C. McCRACKEN	President
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*Institute for Research on Public Policy*

R. CLAYTON	Project Leader, Energy Project, Future Studies Program
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C. LAFKAS	Research Consultant, Energy Project Future Studies Program
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*Interested Citizens Group*

W. MANN	Chairman
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J. MINNS	Vice-President and Public Relations Officer
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R. GARDHOUSE	Executive Officer
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*North Channel Needs Committee*

Mr. E. Burt  
Ms. J. Smith  
Mr. G. Wood

*Peter Middleton and Associates Ltd.*

DR. P. VICTOR	Senior Economist
J. LUBEK	Research Analyst
M. MILOOF	Research Analyst

*Sierra Club of Ontario*

L.R.L. SYMMES	Chairman
G.A. CONSTABLE	Vice-President of Canadian Resourcecon, Consultant to Sierra Club of Ontario
PROF. D. DEWEES	Department of Political Economy, University of Toronto Policy Chairman, Sierra Club of Ontario

*Toronto Dominion Bank*

DR. D.D. PETERS	Vice-President and Chief Economist, Department of Economic Research
P.L. DRAKE	Senior Economist, Department of Economic Research

*University of Toronto*

DR. J.N.H. BRITTON	Department of Geography
DR. D. FOOT	Institute for Policy Analysis Department of Political Economy

*Wood Gundy Limited*

DR. J. GRANT	Senior Economist
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*York University*

DR. M. CHEVALIER	Department of Environmental Studies
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APPENDIX C

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CHRONOLOGY OF HEARINGS

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## APPENDIX C

## CHRONOLOGY OF HEARINGS

## HEARING INTO THE NEED FOR ELECTRICAL CAPACITY

<u>Date of Meeting</u>	<u>Name of Organization and Personnel Representatives</u>
January 10, 1979	Committee Meeting with Staff and Members
January 11, 1979	<p><i>Ministry of Treasury and Economics</i></p> <p>Kogler, R.K., Economist, Social and Demographic Unit, Central Statistical Services</p>
	<p><i>Salisbury, Mrs. H., Manager</i> Social and Economic Data Unit, Central Statistical Services</p>
	<p><i>Schnick, O.M., Executive Director,</i> Central Statistical Services</p>
	<p><i>Statistics Canada</i></p> <p>Norris, Dr. D., Statistical Analyst, Population Estimates and Projections Division</p>
January 12, 1979	<p><i>University of Toronto</i></p> <p>Foot, Dr. D., Institute for Policy Analysis Department of Political Economy</p>
January 16, 1979	<p><i>Ministry of Treasury and Economics</i></p> <p>Jutlah, Dr. C.B., Senior Policy Adviser, Economic Policy Branch</p>
	<p><i>Tully, D.B., Director,</i> Economic Policy Branch</p>
January 17, 1979	<p><i>Informetrica Ltd.</i></p> <p>McCracken, M.C., President</p>
January 18, 1979	<p><i>Data Resources Inc.</i></p> <p>Empey, W.E., Manager of Canadian Forecasting</p>

<i>Date of Meeting</i>	<i>Name of Organization and Personnel Representatives</i>
January 23, 1979	<p><i>The Ministry of Industry and Tourism</i></p> <p>Hill, R.P., Senior Policy Adviser, Policy and Priorities Division</p> <p>Mifflin, R.J., Executive Director, Policy and Priorities Division</p> <p>Kutas, F., Senior Economist, Policy and Priorities Division</p> <p>Lau, S., Economist, Policy and Priorities Division</p>
January 24, 1979	<p><i>University of Toronto</i></p> <p>Britton, Dr. J.N.H., Department of Geography</p> <p><i>Science Council of Canada</i></p> <p>Gilmour, Dr. J.M., Director of Research</p>
January 25, 1979	<p><i>York University</i></p> <p>Chevalier, Dr. M., Department of Environmental Studies</p>
January 29, 1979	<p><i>North Channel Needs Committee</i></p> <p>Mr. E. Burt Ms. J. Smith Mr. G. Wood</p> <p><i>Interested Citizens Group</i></p> <p>Mr. W. Mann, Chairman Mr. J. Minns, Vice-President and Public Relations Officer Mr. R. Gardhouse, Executive Officer</p>
January 30, 1979	<p><i>Canadian Petroleum Association</i></p> <p>Baugh, H.E., Chairman Board of Governors</p> <p>Maciej, H., Technical Director</p> <p>Smyth, I., Executive Director</p>

Date of MeetingName of Organization and Personnel Representatives

	<i>Energy Resources Conservation Board, Alberta</i> Duncan, Neil J., Senior Mining Engineer Coal Department
	Mink, F.J., Manager Economics Department
January 31, 1979	<i>Science Council of Canada</i> Stoian, E.R.Q., Science Adviser
	<i>Energy Probe</i> Conway, C., Policy Research, Toronto Office Marshall, B., Policy Research, Toronto Office
February 1, 1979	<i>Interested Citizens Group</i> Minns, J., Vice-President and Public Relations Officer
February 6, 1979	<i>Sierra Club of Ontario</i> Symmes, L.R.L., Chairman Deweese, Professor D., Department of Political Economy, University of Toronto Policy Chairman, Sierra Club of Ontario Constable, G.A., Vice-President Canadian Resourcecon, Consultant to Sierra Club of Ontario
	<i>Energy Probe</i> Brooks, Dr. D.B., Co-ordinator, Ottawa Office
February 7, 1979	<i>World Energy Conference</i> Foster, Dr. J.S., Vice-Chairman, Conservation Commission
	<i>Peter Middleton and Associates Ltd.</i> Lubek, J., Research Analyst Miloof, M., Research Analyst Victor, Dr. P., Senior Economist

<u>Date of Meeting</u>	<u>Name of Organization and Personnel Representatives</u>
February 8, 1979	<i>Scarborough Public Utilities Commission</i> Curtis, J., General Manager  <i>Ontario Hydro</i> West, G.H., Manager, Load Management Department Code, D., Manager, Customer Application Division, Energy Conservation Division
February 13, 1979	<i>Energy Probe</i> Conway C., Policy Research Marshall, B., Policy Research Crow, R., Adviser and Consultant
February 14, 1979	<i>Economic Council of Canada</i> Gander, J., Co-author, of the report on - The Long-Term Energy Assessment Program, prepared for Energy, Mines and Resources Canada
February 15, 1979	<i>Institute for Research on Public Policy</i> Clayton, R., Project Leader, Energy Project, Future Studies Program  Lafkas, C., Research Consultant, Energy Project, Future Studies Program
February 20, 1979	<i>The Electrical and Electronic Manufacturers Association of Canada</i> Abel, D.F., (Vice-President, Strategic Planning and Review, Canadian General Electric Co. Ltd.) Armour, D.E.P., President and Chief Operating Officer Kluge, H., Chairman (President of Ascolelectric Limited)

Date of MeetingName of Organization and Personnel Representatives

Oliver, D., (Manager, Corporate Planning and Development, Philips Cables)

Raj, S., Manager,  
Statistics and Economic Information

Stephens, J.O. (Technical Director,  
Turbine & Generator Sales,  
Turbine & Generator Division  
Westinghouse Canada Limited)

Wood Gundy Limited

Grant, Dr. J., Senior Economist

Toronto Dominion Bank

Drake, P.L., Senior Economist,  
Department of Economic Research

Peters, Dr. D.D., Vice-President and Chief Economist,  
Department of Economic Research

February 21, 1979

Ministry of Energy

Pinnington, P.E., Acting Executive Co-ordinator  
Conventional Energy Group

Champion, T., Senior Adviser,  
Coal and Uranium,  
Policy Development Group

Dean D.A., Senior Adviser,  
Crude Oil,  
Policy Development Group

Lundeen, R., Policy Co-ordinator,  
Electric Power,  
Conventional Energy Group

Simon, P., Senior Adviser,  
Hydro,  
Policy Development Group

Dominy, G.A., Senior Analyst,  
Strategic Planning and Analysis

Higgins, Dr. R.M., Senior Adviser,  
Renewable Energy,  
Conservation and Renewable Energy Group

Orgill, J.F., Adviser,  
Solar Energy,  
Conservation and Renewable Energy Group

<u>Date of Meeting</u>	<u>Name of Organization and Personnel Representatives</u>
	<i>Rowe, Dr. I.H., Executive Co-ordinator, Conservation and Renewable Energy Group</i>
	<i>Sherwood, E., Senior Adviser, Natural Gas, Policy Development Group</i>
	<i>Wayne B. Trusty and Associates Ltd.</i>
	<i>Trusty, W.B., Consultant</i>
February 23, 1979	<i>Ministry of Energy</i>
	<i>Dominy, G.A. Senior Analyst, Strategic Planning and Analysis Group</i>
	<i>Harper, W.O., Analyst, Strategic Planning and Analysis Group</i>
	<i>Newton, J.W., Acting Executive Co-ordinator, Strategic Planning and Analysis Group</i>
	<i>Rowe, Dr. I.H., Executive Co-ordinator Conservation and Renewable Energy Group</i>
	<i>Rowan, M., Deputy Minister of Energy</i>
February 27, 1979	<i>Ontario Hydro</i>
	<i>Drinkwalter, Dr. D.A., Chief Economist</i>
	<i>Higgins, L.T., Manager Utilization Forecasting</i>
	<i>Skof, L.V., Manager, Marketing Research</i>
February 28, 1979	<i>Ontario Hydro</i>
	<i>Drinkwalter, Dr. D.A., Chief Economist</i>
	<i>Higgins, L.T., Manager Utilization Forecasting</i>
	<i>Skof, L.V., Manager, Marketing Research</i>
	<i>Town of Atikokan</i>
	<i>Pierce, J., Reeve</i>
	<i>Calder, W., Chairman, Atikokan Hydro</i>

<u>Date of Meeting</u>	<u>Name of Organization and Personnel Representatives</u>
March 1, 1979	<i>Ontario Hydro</i> Gordon, D.J., President Nastich, M., Executive Vice-President, Planning and Administration Niitenberg, A., Vice-President, Power Systems Program Taylor, R.B., Chairman
	<i>Ministry of Energy</i> Simon, P., Senior Adviser, Hydro
March 2, 1979	<i>Town of Newcastle</i> Barr, K., Acting Mayor Holliday, J., Councillor Park W., Councillor
	<i>Town of Port Elgin</i> Jamieson, I., Mayor
	<i>Bruce County</i> Spear, A., Warden
	<i>Bruce Economic Development Committee</i> Harron, G., Chairman (former Warden of Bruce County)
	<i>Friends of the Earth</i> Lovins, A.B., Consultant Physicist, British Representative
March 14, 1979	Committee Meeting with Staff and Members
March 28, 1979	Committee Meeting with Staff and Members
October 24, 1979	Committee Meeting with Staff and Members



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APPENDIX D

TRANSCRIPT OF COMMITTEE  
DISCUSSIONS OF ITS CONCLUSIONS  
AND RECOMMENDATION

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MEMBERS OF THE SELECT COMMITTEE ON ONTARIO HYDRO AFFAIRS:

**CHAIRMAN:** MacDonald, D.C. (York South NDP)

**VICE-CHAIRMAN:** Foulds, J.F. (Port Arthur NDP)

Ashe, G. (Dorham West PC)

Belanger, J.A. (Prescott and Russell PC)

Conway, S. (Renfrew North L)

Cureatz, S. (Durham East PC)

Gigantes, E. (Carleton East NDP)

Haggerty, R. (Erie L)

Hennessy, M. (Fort William PC)

Leluk, N.C. (York West PC)

Nixon, R.F. (Brant-Oxford-Norfolk L)

Mackenzie, R. (Hamilton East NDP)

Reed, J. (Halton-Burlington L)

Williams, J. (Oriole PC)

**Counsel:** Schwartz, Alan M.

**Consultant:** Fisher, J.D., Canada Consulting Group, Toronto

**Technical consultant:** Rosehart, Dr. R.H.

**Clerk:** Richardson, A.

**Assistant Clerk:** Stesky, J.

LEGISLATURE OF ONTARIO  
SELECT COMMITTEE ON ONTARIO HYDRO AFFAIRS

WEDNESDAY, OCTOBER 24, 1979

The committee met at 10:20 a.m. in room 228.

SAFETY OF ONTARIO REACTORS  
(continued)

Mr. Chairman: Welcome again. I should explain to the committee that the House leaders gave us permission to meet this morning with a degree of reluctance because it conflicts with two or three other committees. Implicit in that position is that if we have to meet again, which we will, have to at least once or twice more, we may have to find times other than on a Wednesday morning. However, that bridge we will cross when we get to it. Staff, will you lead off?

Mr. Conway: Are you planning to meet this afternoon?

Mr. Chairman: I think it is highly likely because staff feels it will take most of the morning to present it and then you should have an opportunity to take a look at it. Also, at least one member of the committee, Mr. Ashe, has some views and he can't be here this morning so I imagine the burden of our discussion will likely take place this afternoon.

Mr. Schwartz: First let's just mark this as an exhibit entitled "The need for electrical capacity, review and update of material presented to committee January to March, 1979." It is dated October 24, 1979. That document will be marked exhibit number E-11. Just before Jim goes through it, let me remind you that at the end of our last session, we were asked by the committee to review and update the discussions the committee had at that time and to bring forward to the committee some basis for further discussion of that. I hope we have met your needs in the document Jim will go through this morning.

Mr. Fisher: It turned out to be fatter than I thought it was going to be but a lot of it you have seen before and I am sure you remember all the details of it.

Mr. Nixon: Just the last page.

Mr. Fisher: Okay. We will get to the last page eventually. We want to go through this very briefly and review the elements in energy planning we had looked at earlier. Then we want to put those elements together to see why we think energy growth generally is going to be lower in the future than it has been in the past. Then we want to review again very briefly some of the

projections presented to the committee as a basis for arriving at your conclusion. Finally we have a few pages where we have taken a look at some recent information which may impact on the demand for electricity and we will have some comments on what that recent information might mean.

As you recall, in January and February we structured our presentation around the five general topics: the demographics, the economic growth, industrial structure, energy supply and conservation. We found there was a reasonable consensus on many of these topics. Very briefly, on demographics we expect population is going to decline. We expect the economic growth will decline in line with the new population projection, although we will not necessarily have a reduction of real per capita income growth.

The industrial structure is likely to shift further towards the service and high technology industries and away from the resource and manufacturing industries. In terms of energy supply, we found that gas prospects are improving but the oil supply is looking worse. There seemed to be some opportunities in the renewable area that continue to improve. Finally in the conservation area more recent projections of what we might get are more optimistic than they were when the predecessor to this committee met only four years ago. The responses to the higher prices and the responses of technology have been greater than we have thought before.

If you recall, on March 28 we took those five elements and we showed how you can put them into a relatively simple set of relationships and be able to project what might happen to the growth of any particular form of energy. I will review this because we use this a few times throughout.

If you take the growth in labour force times the growth of productivity, you will get your potential economic growth. Then we had a factor we called the energy multiplier which says how much energy growth you require to get that potential economic growth. The energy multiplier is determined by the kind of industrial structure you have and by a number of things which we have loosely grouped under this title called conservation. It includes the responses to price impacts and other things.

Then, if we took that required energy growth, we could project when any fuel is required. If you took energy growth over a number of years, we would say that's how much energy is supplied, and that we need in total. Then you could take a look at the share any particular kind of fuel is going to attain by looking at its price and how available the supply would be. That's how it tied back into—

Mr. Nixon: These are the Fisher equations.

**Mr. Fisher:** --the Fisher equations, yes, although those equations all come out as a very simple set of arithmetic, we are hiding in here a great deal of uncertainty in the forecasting of each and every variable. There is in fact an infinite number of possibilities that you can throw in.

However, we thought rather than just looking into the future we would say in reviewing this: "How would these relationships have worked in the past to produce the kind of pattern and growth we had in the past," and "why are we saying these things are now going to decline or that energy growth is going to decline?" It was only about three years ago that Ontario Hydro presented us this kind of a forecast of their long-term energy growth. It showed that going back to 1919 or 1920 there was a trend in electricity growth--sometimes it was a little higher and sometimes it was a little lower--but the forecast was that this was going to essentially remain unchanged on into the 1980s.

What we have found since then is that now even Hydro is anticipating the trend is broken in some significant way. They have a number of estimates of where energy is going to grow and they are all lower. Their regional estimate, regular estimate, the model they have projects it even lower in their forecast which came in somewhere in the middle. The question is, what is it that is making our energy growth slow down? There are a number of factors and I will review them for you.

The main things that have changed are the key input variables of labour force growth and the growth in productivity. In the post-war era we were looking at numbers like 2.25 per cent per year as a typical growth in the labour force and now we are looking at numbers like 1.5 per cent a year.

In terms of productivity growth in the postwar era, we were looking at numbers like 2.25 per cent as well and in the future most people are forecasting that's more likely to be two per cent. In fact, it has been considerably less in the last few years. So we are looking at GNP growth that would typically be a very sustainable 4.5 per cent growth and now we are looking at forecasts that are coming in at around 3.5 per cent.

(10:30)

We used to think energy growth would parallel the growth in gross national product. This is a chart we had in the 1976 report of the select committee; it was just a way of showing that generally if you had a high per capita energy growth, you had a high per capita gross national product. In fact, during the 1960s the growth in energy was more rapid than GNP in most of the western world but as a generalization, this is the kind of a pattern people looked at. There was almost a one-to-one relationship or maybe even more.

What we found as well was that electricity grew even faster than energy in general and it increased each year from the 1950s into the 1970s from about 11 per cent to about 14 per cent in here and it's now about 15 per cent. There are a number of reasons for that which had to do with its declining real price. One of the reasons we had that kind of a relationship was that we had an abundance of supply of energy. That was reflected in years and years of constant prices. This is a chart which was taken from the energy strategy for Canada in paper of the federal government, 1976. It showed that the price of oil, as a particular commodity, stayed exactly the same until the 1970s. It was very abundant and the price didn't change--and that was true as well for electricity.

Mr. Nixon: Those were the happy days.

**Mr. Fisher:** Those were the happy days.   
This one is from Task Force Hydro which plotted the price of electricity back into the 1950s. It found that in constant dollars, the price of electricity was declining through this period; so it wasn't surprising that energy was used quite abundantly.

**Ms. Gigantes:** What is the discontinuity?

**Mr. Fisher:** There is a discontinuity because they changed the pricing structure for electricity so it was hard to ensure that you were comparing an apple and an apple. When you went back and looked at a 1950 price structure and said we are charging so much per kilowatt hour and then looked at another one in the late 1960s, you couldn't be absolutely sure you had an apple and an apple.

**Mr. Nixon:** I thought the structure was power at cost from the very beginning.

**Mr. Fisher:** It is power at cost but you can take power at cost and argue forever about what the cost is.

**Mr. Foulds:** It's the distribution cost.

**Mr. Fisher:** It's the thing about how much is the cost of capacity and how much is the cost of energy. How much do you pay for the maximum number of kilowatts you use at any one time, your maximum demand at any one time--because you have to have plant on stream for that--and how much should you pay for the number of kilowatt hours you use on a regular basis.

Ms. Gigantes: Did we have any discussion of that change in price structure before?

Mr. Fisher: Of price structure? We had a very general discussion of price structure in the 1976 hearings. We had John Wilson talk about marginal cost-pricing and incremental-

Ms. Gigantes: But we never had any description of how there was a discontinuity comparing pre- and post-1969.

Mr. Fisher: No, we have never gone into that.

Ms. Gigantes: Where did you get this chart?

Mr. Fisher: That's from Task Force Hydro. I think it's report number 2 or 3.

Ms. Gigantes: 1974.

Mr. Fisher: Yes.

Ms. Gigantes: Interesting.

Mr. Fisher: So now, very briefly we look at those factors which were there before the 1970s. Now we have quite a different view. Here are the charts taken out of the recent Ontario energy review and it shows there are doubts about the long term supply of conventional fuels. This particular one is oil and it shows that the demand is projected to grow rather modestly. That's a very complicated chart and I have taken the medium projection from both. The supply in fact is going to decline and we will be in this importing position throughout the 1980s.

On the gas side, which is taken out of the latest National Energy Board report, it shows the supply is ample for a while but then it begins to decline and as demand grows it eventually crosses over. A new look at gas might not come to the same conclusion but--

Ms. Gigantes: But we never have. Is there any more reason for us to take for example the gas supply and look any more seriously than we did in 1975 when they told us those lines would cross over at 1981?

Mr. Fisher: I would expect the next time someone does a review of the prospects for gas that those lines will cross away out beyond the year 2,000.

Ms. Gigantes: What is the date?

Mr. Fisher: It's the latest National Energy Board report which came out in 1979 but was based on hearings that were conducted during 1978. If you will recall, the gentleman from the Alberta Energy Resources Conservation Board, when he was here, said that essentially since that information was presented to the National Energy Board, the reserves in Alberta had doubled.

Ms. Gigantes: Is this where they are asking for exports?

Mr. Fisher: Yes, they were asking for exports on the basis of this sort of stuff. But of course in addition to Alberta, we also have the east coast prospects

and the Arctic is coming close to being an economic field. But wherever we push this out, at least on this one, I think there are these doubts, continually about oil, and oil prospects haven't changed significantly.

Ms. Gigantes: But we haven't seen the kind of increases that producers would like in prices that would be likely to change.

Mr. Fisher: We are likely to change that. I think these kind of projections do implicitly include a significant price increase because they included in their supply quite a number of tar sands and heavy oil plants coming on stream through the 1980s. This recent request of the oil companies for higher prices are based on meeting those kinds of projections, saying if you would like these oil sands plants to be built, this is the kind of money that will have to be raised.

Ms. Gigantes: Called the sands policy.

Mr. Fisher: The sands policy indeed.

Mr. Conway: In the meantime buy your wood stove now.

Mr. Fisher: Okay, this gets us to price, which is one of the ways of saying what's going to happen in terms of supply. We know that crude now is at about \$13.50 a barrel and it's possibly going to climb to at least the \$24 a barrel level which is the current world level. Everybody is talking about it and saying that it should be there over some period of time, and I think we can anticipate that number is going to grow.

At the moment, we are looking at fuel oil of about 67 cents a gallon. If you increase that on the same ratio as increase to a world price, you would be looking at \$1.20 a gallon for home fuel oil. The residential rate for gas now is around \$3.30 a thousand cubic feet. If you increase that proportionately to this increase in the price of oil and then discount it back to 65 per cent, it will grow to about \$4.50.

Mr. J. Reed: Excuse me. Where do you get 65 per cent?

Mr. Fisher: The current number is 85 per cent. The number that is now debated is the number saying that it should decline to 65 and we should be encouraging changeovers, and so forth. So if you put it at 85 per cent, that number will grow to--I think it comes to \$5.40 or \$5.00 or something like that if you have it just grow proportionately. Who knows where it will go to.

Ms. Gigantes: That's a Fisher policy.

Mr. Fisher: No, that's if you believe that 85 per cent on a BTU basis is a good way of maintaining it, then that's where it would go to.

Mr. Chairman: \$5.40?

Mr. Fisher: Something like that. I can give it to you in a second. I should remember: \$5,86.41. The electricity, the residential rate, if you are listening to your television advertising, for the typical residential consumer is around three cents a kilowatt hour, and that is supposed to go up about--

Mr. Nixon: It's amazing how they hold that price down. I am glad they keep telling us on television how amazing they are.

Mr. Fisher: That is supposed to go up 16.5 per cent next year, which would put it around 3.5 cents a kilowatt hour in 1980.

Mr. Nixon: Ontario Hydro's financial projections have it going up around nine or 10 per cent a year for at least the next few years. We look at price going up, and I think what that leads us to is to say these are the kinds of factors which have led us to a new sort of relationship between gross national product and energy, and this new conception of where energy is going to grow.

As we said before, the GNP is not going to grow as rapidly as it did in the past, mainly because our population is slowing down and our industrial structure is changing somewhat. Even at these lower growth rates, we are looking at new kinds of energy multipliers. It no longer has to be a one to one relationship or even more. In fact, people are now talking about lower relationships, and 0.5, which was probably considered earlier in the year to be a very radical decoupling, is now probably considered more reasonable.

The numbers we had before were numbers like 0.6, but that is probably not an unreasonable number. Energy growth rates in the past were around 4.5, and as I said,

in the 1960s, they were higher than that. They were more like 5.5, with electric growing at around 6.5, and in fact, in the 1960s, they were seven per cent. Now when we are looking at energy growth rates people aren't surprised to be looking at numbers like two per cent, maybe 2.5 per cent, and the question for today is what does that mean for electric growth.

Mr. Nixon: So the GNP and the energy growth rate, which have been magically coupled in the past, almost on a one to one basis, are uncoupled.

Mr. Fisher: Uncoupled, yes.

Ms. Gigantes: Can I ask another question? The rate we looked at for energy growth in the 1960s, that you are referring to there, of that, really a large component of that higher growth rate, would have been the rate of growth in electric energy?

Mr. Fisher: It was, indeed, yes, it was. When you looked at primary energy growth--when you were looking

at the 5.5 kind of number--electricity would contribute a lot to that higher number. Those were typical numbers. In fact, if you look, western Europe's number was 9.5 per cent. Japan was 15 to 16 per cent. These were really huge numbers.

Okay. All of which is to say it shouldn't surprise anyone, or no one should think we are doing anything particularly startling, to say energy growth in the next 25 years is not going to be at the same high rate as it was in the last 25 years.

We then looked at various people's projections. We focused--although this thing said we "forecasted"--in fact, we tried to focus--

Mr. Nixon: There ought to be a word "forecuse."

Mr. Schwartz: It probably, in fact, did say "forecuse."

Mr. Fisher: We "forecuse" on these two projections, which were the ones were presented to us and that were particular to Ontario. We particularly "forecused" on electricity, and we looked at them in two pieces. If we looked at what they do to 1985, we found they produce remarkably similar results, although they come at them in a different way.

Anyway, by 1985, both the ministry and Hydro were agreeing on about the kind of growth there would be in electricity. We found, though, if we looked beyond 1985

and we looked out to 2000, the Ministry of Energy was forecasting a far lower growth in electricity than was Ontario Hydro and Ontario Hydro's forecast was coming down. Even at the end, it was still looking at rates of growth that were about twice as high as the growth being projected by the Ministry of Energy.

Mr. Nixon: Those are megawatts on the left?

Mr. Fisher: Those are megawatts, yes. Those are

the implications in terms of megawatts, yes. When we tried to reconcile these projections to the information we heard, and if we look just at the medium-term kinds of information we heard, and looked at the projections, we found if Hydro and the ministry were to accept the consensus of the evidence presented to us, in both cases they would have reduced their projection, because the assumptions they made in terms of the Hydro model and in terms of the ministry's multiple models were optimistic. "Optimistic" may not be a good word, but certainly they were higher.

[10:45]

The ministry had not come down to the latest demographic information. Their economic growth assumption was quite optimistic. On that one, Hydro was in fact,

quite pessimistic. They assume the same industrial structure, and the kind of evidence we had indicated there was a change going on in Ontario's economic structure. They were relatively pessimistic on the possibilities for the alternatives and for conservation. This is in the middle term, medium term. In fact, in the longer term, we found the ministry is really quite, if you will, optimistic about conservation.

Mr. Nixon: What reason did Hydro give us for being neutral on demographics?

Mr. Fisher: No, they weren't neutral on it. It is just they had incorporated the consensus, the latest consensus on where the demographics were. They were right on with the kind of evidence we received. They were up to date on it.

Mr. Nixon: Oh, I see.

Mr. Fisher: Their projection was about the same as the TEIGA figures we got, and Barry--David Foot or Barry Foot?

Mr. Schwartz: Dr. Foot.

Mr. Fisher: Dr. Foot.

Mr. Conway: Barry Foot used to catch for the Expos.

Mr. Schwartz: Now he's with the Chicago Cubs.

Mr. Nixon: Are we up to date on the demographics now?

Mr. Fisher: It seems to me there has been some quite recent projections, particularly emphasizing population changes in Metro, that people have been talking about. Do you know anything about those?

Mr. Fisher: They are moving out from Metro. I don't think there has been another official population projection which is more recent than the ones we got, because we got the latest treasury one, the very latest one, and we got the very latest Statistics Canada one.

Mr. Schwartz: In fact, our Statistics Canada one wasn't coming out for another few weeks.

Mr. Fisher: That's right.

Mr. Schwartz: It wasn't official when we got it.

Mr. Fisher: That's right. The only thing which may have changed since then is some people may want to change their net migration numbers to indicate more people may be leaving this province to go somewhere else, although that trend was there in their projections. They said there was a trend, a movement from Ontario west, which was in those late projections. I don't think they would be very different.

Mr. J. Reed: Jim, just for my satisfaction, why did Hydro suggest there would be higher economic growth? Do you recall that?

Mr. Fisher: Sorry. This is kind of a confusing chart, everything is backwards on here, because I am saying: What would be the impact on their load forecast? Higher, in this sense, means they in fact, projected a lower economic growth than most people did. If they moved their economic growth projection up to the consensus view, they would have had to raise their load forecast, so it is their load forecast that would be higher.

Mr. J. Reed: I think I understand.

Mr. Fisher: Let me just try it on this one though, so we are clear. The Ministry of Energy had a high projection of economic growth for Ontario, higher than anyone else we saw. If they were to lower their economic growth rate, they would end up with a lower forecast.

We are saying what these little things mean is the effect of changing the assumption in any of these areas to the consensus of what we heard, would make their projection lower. Their projection goes lower if they had changed. Hydro would have increased theirs if they had gone to the consensus on where the economy is going.

Mr. Foulds: You're right, that is a confusing chart.

Mr. Fisher: It is a confusing chart, yes. One has to spend some time.

Mr. Schwartz: It's the only one I thought of.

Mr. Fisher: Yes. In the longer term, we looked at Hydro and the ministry against several other projections we saw, which went from the Amory Lovins projection of what should be happening to energy in a general sense, to Energy Probe's renewable and conservation scenario. We had a Sierra Club presentation and we also had what Energy Probe called their likely scenario. I have got a mislabelling here and I can't remember who it is. Oh, I know what it is. That should be Sierra and that should be Energy Probe's likely scenario.

This one is Energy Probe's likely scenario. If you recall, they did a renewable and conservation scenario and they did a likely scenario.

Mr. Nixon: What is R/C?

Mr. Fisher: Renewable and conservation scenario.

Mr. Nixon: We are very sensitive about that these days.

Mr. Fisher: Yes. This was the projection from the Institute for Research and Public Policy, this was from Hydro and this was the long range energy assessment plan projection which came from energy, mines and resources, when we looked at them in the long term, they fitted into this kind of a category--

Mr. Nixon: That was the previous administration's--

Mr. Fisher: Yes, previous administration. We said a more useful way of doing it is to say, look, where they

fit in fact, is into these three different camps. There was a maximum conservation, maximum renewables, the so-called soft path. There is what they call the economic conservation and lots of electricity to substitute for conventional, which people have labelled the hard path. Then there is--I don't know if you can call it a middle path--I have called it something else later on--which is an economic level of conservation, but you look at coal and renewables to fill in the gap in the conventionals.

Ms. Gigantes: Jim, there is no indication the federal government's planning basis has changed from the LEAP report.

Mr. Schwartz: The LEAP report wasn't a report of the federal government. Mr. Gander and his associates I think did that, sponsored by the federal government, but I believe it was considered to be an independent view which the government published as helping the debate. They took no official position on it.

Mr. Fisher: Yes, although, as we will see later,

it is in line with the general federal thrust.

Ms. Gigantes: It has certainly been the feeling I have had in Ottawa.

Mr. Fisher: Yes, I think it is. In fact, I am glad you asked that question because it leads us on to the next slide which in fact, shows you that when we looked at these national projections they all came up with quite different assumptions. In fact, when we looked at these two different assumptions, in terms of energy requirements for the national picture, if you looked at the National Energy Board's staff which combined to do this kind of thing and the EMNR, Jim Gander's staff, who talked to each other a lot, you come up with quite similar numbers. He is a little bit more optimistic, if you will, on the decoupling, but that is as close as you are going to get. You can consider 2.8 and 3.0 to be the same number.

Ms. Gigantes: In fact, the planning that's going on at the NEB is at a harder level in terms of traditional energy supplies.

Mr. Fisher: The interesting thing I will tell you about the NEB is they really have what you might call quite an optimistic assumption about the non-conventional. They think non-conventional will grow to around four per cent. Where the NEB is most conservative is on how much impact the "conservation" is going to have on energy. Because they have this, they end up with a relatively high number here, and it is their nature to be relatively pessimistic in recent years on the conventionals. They end up with this huge electricity number to fill the gap.

Mr. J. Reed: These figures on IRPP and LEAP and so on assume massive migration into electrical utilization; do they not? Don't they assume a large shift in--

Mr. Fisher: Yes, growth in electricity.

Mr. J. Reed: --the growth in electricity?

Mr. Fisher: I am glad you asked that question because that leads us right on to the next slide which is how did these various projections come up with a match of supply and demand. What we saw was in these three projections was they were all quite pessimistic on what would happen with oil. They all said the share of our energy market which is served by oil is going to decline quite substantially by the year 2000. Then the question was: How do you pick up this declining share?

The long-range energy assessment program says of this -16 in oil: gas is going to pick up about one point; the renewables are going to pick up about five points, they are going to go from zero to five essentially; coal is going to pick up a lot of it; hydro and nuclear will hold their own; but this coal is going to go into electricity and we are going to have this huge increase in the share for electricity which requires a very high growth rate in electrical capacity.

The Institute for Research and Public Policy said oil is going to go down even more than people have been saying, and they did not believe when they looked at it that the gas supply picture was going to improve significantly. They had a very optimistic view on what renewables would do.

Mr. Nixon: It's much bigger even than the Welch dream.

Mr. Fisher: It's a very high number.

Ms. Gigantes: Whenever one looks at these things we always start from zero in 1979 renewables. Even apart from hydro power, if we didn't have the sun we would use a lot more oil heating our houses.

Mr. Fisher: Right, that's so.

Mr. Nixon: So you want to use the sun shining as something above zero base?

Ms. Gigantes: It's called passive solar.

Mr. Fisher: Passive solar.

Ms. Gigantes: It is part of the energy we use in the economy.

The reason I asked this question is, is there any difference between IRPP and LEAP assumptions about what we start from as the base for renewables?

Mr. Nixon: If you count that, certainly the 18 percent is achievable.

Mr. Fisher: They would all start with the same base. You see, they would all start with what you might call the active energy consumption, because that's what everyone starts with, how many barrels and how many MCFs of the active energy.

To the extent we are using passive solar, it would be I guess, if you will, implicit in the base with which they all start.

My recollection of the IRPP now is the renewables were wood.

Mr. Schwartz: No. It is their solar hybrid. Anyway, I can't remember at the moment.

Ms. Giganteo: Are they counting hydro?

Mr. Fisher: No. Hydraulic and nuclear power are in here. They had this hybrid heating system which they came up with, which required a lot of electricity, and some gas as the peaking fuel rather than doing it the other way around.

Mr. Chairman: That point gets confused because in the last Ministry of Energy statement made by the minister on October 1, he includes new hydraulic development as a renewable. Hitherto it tended to be bunched into the Hydro global, which included nuclear and coal and everything else. From this point on the thing is going to get a bit confused.

Mr. Fisher: It gets confusing, yes.

Mr. Chairman: It was a way of boosting the renewable component, if I may put it bluntly, but it is essentially true, it is renewable.

Mr. Foulds: I am intrigued by the category called hydro and nuclear. What other kind of energy does nuclear produce besides electricity?

Mr. Fisher: Well, it's electricity.

Mr. Foulds: It's hydraulic electric and nuclear electric, yes.

Mr. Fisher: This is the NEB. This was out of their gas report where they said oil is going to decline, and that was in line with their latest thing, that gas will just hold its own. The renewables will go from one per cent to three per cent, which was a two per cent change, and the gap was going to be made up by hydraulic and nuclear developments across the country. That's how they got their balance.

This meant this one directly went into Hydro, to electricity, growing at nine per cent, which comes out to about 4.3 per cent in energy. Of course, the fascinating thing about this kind of a number was it does imply a higher rate of growth, or quite a high rate of growth in the building of capacity because that is an energy number, and it is quite likely the capacity would have had to grow at a higher rate than that.

The Ministry of Energy's assumption was oil would decline, gas would hold its own, and they would get about three per cent more from coal and about three per cent more from hydro and nuclear, so hydro was going to grow. This ended up with about 2.8 per cent on energy.

Ontario Hydro didn't specify these things and their model doesn't go into this, and the royal commission didn't, as well, although the royal commission did have electricity picking up what you might call the substitutes market.

[11:00]

Mr. Nixon: On the very first one, the LEAP thing, oil is down 16, gas is up one, renewables up five, coal is up 12; hydro and nuclear are going to stay the same?

Mr. Fisher: Yes, that's what they say.

Mr. Nixon: Then the association down at the bottom, required annual growth in electricity;"

Mr. Fisher: What you have to do is put them together with this. If this going to grow at 2.8 per cent per year, what they would say is Hydro and nuclear will grow at about 2.8 per cent a year as well. But coal is going to have to grow at faster than 2.8 per cent per year because it is going to have to increase its share. It is going to have to do a bigger job than it's doing now.

Mr. J. Reed: Did that calculation consider the impact of the massive Hydro projects that are reaching completion now, when you are talking about hydro power simply holding its own? Quebec has four turbines running at LG-2.

Mr. Fisher: They would have included that. We have to remember that we are going up to the year 2000 here.

Mr. J. Reed: And the great federal announcements about the huge hydro projects in western Canada last year? Mr. Fisher: Who knows how much they included of that? The LEAP project was written in 1978. You might have quite different assumptions about where things are going to be, certainly on the supply side, if you wrote it at the end of 1979.

Mr. Nixon: Is there another way we may have to look at those numbers? We look at those with a certain objectivity saying, "Oh yes, this is what this share of the energy will have to do in the future."

But when the first occasion comes that the oil truck misses a delivery, a lot of these figures are going to be thrown into a cocked hat, it seems to me, along with all of the assertions in the House and the assurances from the Minister of Energy (Mr. Welch) that he has been assured that all of the oil fuel contractions will be maintained this winter. There is an implication there since he says, "I have been assured that . . . that maybe they won't be and maybe next winter they won't be. We're going to plug in a lot of electric heaters.

Mr. Fisher: Possibly.

Mr. Nixon: Possibly. I think they are events that really on a short term--almost unpredictable--

Mr. Fisher: Yes, that's right.

Mr. Nixon: --that are going to play hell with our smooth long-term projections.

Mr. Fisher: That's right. I think it's very likely that there will be some short term changes which can go up and down and all kinds of things. What we are trying to look at here is to say what will happen between now and the year 2000, where will we be, what kind of stable position will we have in the year 2000, will people in fact convert to electricity, will they for the next 20 years use electric heaters or will they next spring call up their man to come and put in a gas furnace?

Ms. Gigantes: Do you know how many people have done that for this fall?

Mr. Fisher: No. And when they do put in a gas furnace, how many of those people will say, "Take out my electric water heater as well and let's have a gas water heater." That's half the load.

Mr. Conway: I think Bob's point is, surely, how reliable, even in the short term, are those patterns if this January there is a serious shortfall?

Mr. Schwartz: The whole point though is that this is really not a short-term program--

Mr. Conway: I realize that. Mr. Schwartz: --because it's a long-term look and short-term aberrations--and I think Bob is right, there will be aberrations--one would expect will find their way within that over the 20 years.

Mr. J. Reed: Maybe it would be appropriate then, sort of expanding on that, to ask if, in any of our calculations, we have tried to assess to what extent those aberrations could go. What would be an outside calculation? In other words, is it physically possible in case of, say, an oil shortfall to transfer 2,000 megawatts into electric heat, even temporarily over the course of a winter? Is that a physical probability if the worst possible scenario occurred?

Mr. Schwartz: I think later on Jim is going to address the question of substitution, electricity for oil, and give some view on that. Maybe that will help a bit.

Mr. Fisher: Lets just remind ourselves of why the scenarios did have some importance to Ontario Hydro and maybe one of the reasons why this committee was reconvened to talk about it. Let's remind ourselves of what the numbers are that we are looking at.

We looked at 1979, the requirement today with a 25 per cent reserve was about 20,000 megawatts and we had about--

Ms. Gigantes: You used to say 17,000 for this. Mr. Fisher: For the 1979 forecast demand?

Ms. Gigantes: Maybe I was just being generous to you.

Mr. Nixon: The forecast demand has already been met. The peak has been passed probably.

Mr. Nixon: It will be in December.

Mr. Fisher: Depends on which way you look at it.

Oh, I see. You mean, the peak for the year is now coming in January?

Mr. Fisher: No, the peak for the winter season comes in January. But the peak for the calendar year comes in December. What will happen is over the winter season if we had, say, 16,000 megawatts in December we will probably have 16,100 megawatts or 16,200 megawatts in January.

Mr. Nixon: Let's put it this way. The meters will record what is the highest demand for the calendar year in January.

Mr. Fisher: No, they won't. They'll probably do it in December because what will happen is, if it's 16,000 in December and it's 16,200 in January, by next December it will be 16,500 or 17,000 megawatts.

Mr. Nixon: So the winter peak comes in January. The calendar peak comes in December.

Mr. Fisher: Yes, the peak still seems to come in December.

Mr. J. Reed: That is presumably because some growth took place over the year.

Mr. Fisher: Yes, that's right.

Mr. Nixon: Are we still satisfied with that? We usually talk about it in terms of being too big a cushion but with our recent experience in the reliability of our generators, it doesn't seem to be too big anymore.

Mr. Schwartz: It's a fairly recent study that settled on the figure of 25 per cent.

Mr. Chairman: Hydro has now accepted that, whereas previously they argued 30 per cent.

Mr. Schwartz: In fact, it's a Hydro study. It's a Hydro document that takes it down to 25 per cent and I believe that--

Ms. Gigantes: Bob has a point, doesn't he? Because in February this year when the States wanted electricity we had 200 megawatts to sell.

Mr. Schwartz: I don't think, though, that Hydro today is thinking of revising that reserve number. I think we'd know about it if they were.

Mr. Nixon: Their recent history in reliability has been disastrous compared with everything they have experienced for 50 years.

Mr. Schwartz: One of the things about the 25 per cent reserve is, it is based on the fact that at some

time, once every 10 years, let's forget what the measurement is, at sometime in a decade, let's say, we will be short for five minutes or a minute or an hour for pretty close calls, we haven't been short. I think in the end all planning is based on the fact there will be a time when we will be short. It is worth the societal price to pay in the sense of being short for 10 minutes rather than to have this incredible reserve at all times.

Mr. Nixon: Yes, I agree with that entirely.

Mr. Schwartz: Really, all I am saying is it's true they have had some problems and some close calls but in the end the system has been good enough not only to get through it but we haven't had a shortfall yet.

Mr. Chairman: What is the position of Nanticoke in that picture? In other words, what proportion of the 25 per cent is permanently not available because of Nanticoke?

Mr. Fisher: I don't think you can say it is permanently not available. In fact, Hydro sent us some stuff--

Mr. Chairman: What is Nanticoke producing?

Mr. Fisher: --which was in high dudgeon when we criticized Nanticoke. I don't remember if I brought it or not.

Mr. Nixon: They must be very sensitive about it.

Mr. Fisher: I guess so.

Mr. Chairman: For good reason.

Mr. Fisher: Just to review for a second. Hydro does not plan and say, "There is the demand" and add 25 per cent. In fact, what they have is a rather sophisticated way of coming to a reserve number which is based on the probability of various units going out of service. The probability is based on their experience with the units and with their forecast on the availability of those units.

It is a very sort of complicated probability calculation that they run through to say, "How often with these kind of probabilities and this kind of demand are we likely to come to a shortfall." That approximates a 25 per cent reserve. But it's far more sophisticated than saying we just add 25 per cent.

If you just accept that as a round number of where we are in terms of requirements, the prospective supply is about 23,500 megawatts today. We have certain projects which we called at that time.

Mr. Chairman: To fill the gap in my own knowledge, what is the capacity of Nanticoke?

Ms. Gigantes: Five thousand, isn't it?

Mr. Chairman: Is it 5,000? It has not played such an important role up until now, but if we knew what the total capacity was.

Mr. Nixon: Did you say it has not played?

Mr. Chairman: It has been in the system and yet it hasn't been available to such an extent.

Mr. Nixon: Been in and out.

Mr. Chairman: Therefore if you're talking about what represents, it seems to me we should know, (a) the maximum it can produce, (b) what its capacity rating has been in recent years, and to what extent it is improving.

Mr. Fisher: Yes, 3,920 megawatts is what it is. Somewhere, I will try and get for you and have in your hands shortly, the performance of Nanticoke which is not overall as bad as maybe its particular reports on what it might have been on a particular day, would lead you to believe.

However, it is our assumption anyway that they do take into account their uncertainties about any particular plant when they do their calculation.

Mr. Chairman: In other words, when they do that sophisticated calculation plant per plant, presumably they have Nanticoke rated fairly low because of the record.

Mr. Fisher: One would expect so. It is necessary for the committee to be more conservative than Hydro is on how much reliability they need. We don't have the detailed numbers we could get them. They will be on a unit by unit basis with the probability of it being out. You could put in another number if you want, but the essence of it is that you are going to get some number, 20, or 21 if you want to make it that. I don't know what you want to do.

Mr. Nixon: The second bunch there.

Mr. Fisher: The second bunch; well, that's what they have in place now and these were the ones which were coming on stream very shortly, which was the Keith plant. Now, of course, that one is being mothballed again. But it is still there as being virtually ready to go.

Mr. Nixon: I just want to know about that. They have done the modernization, they have run it up to full power and they have said, "As soon as we know it's capable of full power we are going to mothball it." So is it just sort of in the state now where it is standing there capable of full power?

Mr. Fisher: Yes, that's what we understand.

[11:15]

Mr. Chairman: There's another one there that has never appeared anywhere and I was startled to see in a Hydro document that came across my desk about two months ago that five of the eight generators in Hearn have been mothballed. In all of our testimony I never heard any suggestion of that. Where is it in this picture?

Mr. Fisher: That's right. We should take it off here. This is the chart we used in our last presentation.

Mr. Nixon: Did Hearn convert back from gas?

Mr. Haggerty: They are using coal now.

Mr. Fisher: They have some. There are eight units and five of them could take coal or gas and three of them take gas only.

Mr. Nixon: They have cut out the gas ones because somebody out in Alberta said they wouldn't sell us gas for them.

Mr. Fisher: They have kept the convertibles going, I believe.

Mr. Nixon: The last convertibles.

Mr. Fisher: It's a few hundred; that's what it will take.

Mr. Chairman: You mean the five units would only take a few hundred out?

Mr. Fisher: Yes. It's a very small station. It's not a big station.

Mr. Schwartz: It wouldn't matter.

Mr. Chairman: Oh, really?

Mr. Fisher: Richard L. Hearn is 1,104 megawatts in

eight units. They have taken a few of those units out.

Mr. Schwartz: What we are telling you is that whether they are in or out really won't matter very much for the totality we're talking about.

Mr. Fisher: It's 1,100 total, yes.

But they haven't mothballed the total plant.

Mr. Conway: If they had taken five of eight, presumably that would be what 600 or 700?

Mr. Schwartz: There are three of them.

Mr. Conway: They have mothballed five out of eight?

Mr. Fisher: Is that right? Five out of eight?

Mr. Schwartz: Five of eight.

Mr. Fisher: I thought it was three for sure and two still being studied.

Mr. Conway: My recollection is five.

Ms. Gigantes: Can I get the sense of the interest in this? We're not suggesting they should be burning gas to produce electricity at Hearn, but rather, if there was some kind of absolute crisis, it would be possible for a very short period of time, expensive and stupid though it might be, to burn gas and produce electricity to keep us warm.

Mr. Fisher: Yes, that would be right.

Mr. Chairman: The purpose of my query was, where does Hearn fit into this?

Mr. Fisher: At the moment it is here. Capacity today.

Mr. Nixon: Whatever is left.

Mr. Fisher: Capacity today. Even if it's mothballed, it's still capacity today. It's on stream and ready to go. So there is some Hearn in there which is mothballed--

Mr. Chairman: Just a minute, Jim, if Hearn is in capacity today, so is Keith.

Mr. Fisher: Yes, there is Keith. But, 1980 is when Keith was going to be declared fully in service.

Mr. Chairman: But it already has.

Mr. Nixon: The mothballing decision came after that number.

Mr. Fisher: That's right. The decision came after that; where it fits in here, I'm not sure.

Mr. Nixon: At 26,000 down to some number that doesn't look so embarrassing.

Mr. Schwartz: Yes, 25,000.

Mr. Haggerty: Then look to Darlington.

Mr. Fisher: Then Darlington comes down at the bottom.

Mr. Foulds: Whether the unit is mothballed or not, it always comes under the category of prospective supply because you can always de-mothball it to make a supply.

Mr. Fisher: That's right. It is plants that are sitting around. One way or another. Then we have the Thunder Bay plant.

Ms. Gigantes: I'd like to ask a question on that. Do they keep standby plants at a mothballed plant?

Mr. Fisher: I imagine they would have a coal pile. It wouldn't be any use if they didn't have a coal pile. If you go down to Hearn there is a huge coal pile.

Ms. Gigantes: If you have a coal pile and there is a two week cold snap and you decide you want to use your coal power it's probably frozen under four feet of ice by then.

Mr. Fisher: I don't know.

Mr. Nixon: Listen, they keep lots of staff people breathing hot breath on it, or something like that--all sorts of people standing around there playing pinocchio in case they are needed.

Ms. Gigantes: I feel reassured--as usual when Mr. Nixon speaks.

Mr. J. Reed: What about Lennox? Is it written into that capacity?

Mr. Fisher: It's in here.

Mr. J. Reed: Good.

Mr. Nixon: You mean to say their tanks are full of oil and Lennox is ready to go?

Mr. Fisher: Lennox and Kingston. Two thousand megawatts, is it not?

Mr. J. Reed: It's not running.

Mr. Fisher: It's not running now?

Mr. J. Reed: Not to my knowledge.

Mr. Haggerty: That's a standby for the other one. Mr. Fisher: Sure, that's because you have 23,500 and you are not dipping into your reserve. You only have to run 16,000, you are not going to run any of your coal and oil plants. You are not going to run any of your oil plants as a starter. You'll run none of your gas plants. Then you are back into your coal plants.

Ms. Gigantes: I think the interest among members of the committee really stems from what happens if we can't get Nanticoke to work in a cold period in February plus you get two units out at Pickering. Can we get these mothballed places running? Are there standby fuels? How long does it take to get them up? It would probably take as long to get them running as it would to get over the cold snap.

Mr. Fisher: I expect so, yes.

Ms. Gigantes: That's really, I think, the basis of the interest.

Mr. Fisher: At any rate, whatever you want to say about how reliable some of these numbers are, there is a huge difference between 23,000 and 16,000, which is what we would have--the 23,000 here, and by the time Pickering comes on we are up to 26,000. Plus, at the time we did this these were not cancelled; we had the Atikokan plant coming in on 1983-84 and then 1990.

Mr. Nixon: And that is going ahead full steam.

Mr. Fisher: In two stages, yes, that's right. Bruce B is going ahead, and Darlington, which has slipped a year from the time we did this. The new years for Darlington are now 1987, 1988, 1989 and 1990. So we still have this total potential supply of 33,204.

Mr. Chairman: I thought Darlington was 34--850 for four units.

Mr. Fisher: It is, in fact, you are right. It is 34. This one is 3,076. They are approximate numbers, but this number is 33,204.

Mr. Foulas: Our supply is more than twice our forecast demand for this year.

Mr. Fisher: Yes, but this is by 1990. This is what is committed. What we are coming to is saying, if that is what we are committed to, when we look at these energy growth rates, what does that do? Do we have enough out there?

Ms. Gigantes: Do you just want to get by that page?

Mr. Schwartz: Yes, quickly.

Mr. Fisher: It depends on where you come out. If you were in the soft path camp and you think electricity need not grow at greater than one per cent a year, then we are going to have a surplus up until the middle of the next century.

If you are on the hard path and think electricity is vital as a substitute for declining conventional fuels, then we will use up that 33,000 megawatts by 1989 and we will be building like crazy because we need six more to come on in the 1990s.

If you are on what we have labelled the mushy path, which is some of the soft and some of the hard, you end up with a three per cent average annual growth and by the year 2,000 you need about 37,000 megawatts, so that you have used up this committed supply, including Darlington, in the year 1996 and you need one more, which would come on stream presumably in the years thereafter.

One of the numbers you might want to note is that it is the four per cent number--in fact it is a tiny bit more than four per cent--which makes the current construction schedule at Darlington match the demand. So if you think Darlington should continue on its current schedule and you are just looking at it meeting demand and not all kinds of other reasons why you might want to build that plant, you have to have electric demand growth of a little better than four per cent.

Ms. Gigantes: Can I just repeat what you have told us, because I think it is kind of in dramatic terms.

Mr. Conway: You are for mushy.

Ms. Gigantes: I am going to look at mushy. If we assume the four per cent growth in electric demand, as soon as we reach 1992, between 1992 and 2000 we will have to build three more Darlingtons.

Mr. Fisher: That is right.

Ms. Gigantes: A lovely thought.

Mr. Nixon: That is right.

Mr. Haggerty: What about a mushy mushy?

Mr. Schwartz: It is the firm side of mushy.

Mr. Chairman: Implicit in your answer to Evelyn is that all of these calculations are on the assumption that every new plant will be as big as Darlington.

Mr. Fisher: Yes, that is right, when I say three plants.

Mr. Chairman: Three the equivalent of Darlington.

Mr. Fisher: Three equivalents, yes, that's right. In fact if you recall that the next generation of plants is 1,250 megawatt plants, so that is 5,000 megawatts in a plant, 1,250 per unit. So it is fewer sites.

Mr. Chairman: Is that a decision?

Mr. Fisher: That is not a decision, but in the original plan of the buildup of generation you had the Pickering ones which were 500, you had the Bruce and Darlington ones which were essentially 850, and then the next one was going to be 1,250.

You can see why you need it. You can see that if you are growing here, let us say, and by the year 2000 you are at 60,000 megawatts, to use a round number, and you are growing at five per cent a year, you have to bring on 1,200 megawatts a year just to keep up. So you plan for capacity additions to come on in 1,200-megawatt bunches. In a couple of years it has to be 1,500-megawatt bunches. You are driven by the demand to move yourself up constantly to larger increments.

Ms. Gigantes: You will remember, Jim, when we started in 1975-76 and there was an implied growth rate of seven per cent, Hydro talked to us about that, implying in turn a doubling in the size of the electric system every 10 years. Isn't it true that once you get to those larger units, because of the reserve capacity you are going to have to associate with those larger units, you get a doubling effect on your electric system at a growth rate lower than seven per cent?

We are looking at a period from 1979 to 1989—the top year for the end of Dartington in your previous page. We move from 16,000 megawatts forecast demand to a capacity of 33,000, which is more than a doubling because of the reserve capacity.

Mr. Fisher: Yes, but you have to think about relative and absolute. In absolute numbers, yes, you would need a larger reserve if you had larger units. If the assumption is the size of your units is matched to the size of your system, then on a percentage basis it need not be bigger.

Ms. Gigantes: But in fact that has not been the recent experience, has it? If in February 1979 you are not getting the generation you expect out of Nanticoke, you lose a couple of units at Pickering and suddenly you are close to the edge in a cold snap, 25 per cent reserve may be quite an abstract.

Mr. Fisher: What really is the thing that kills you on Nanticoke and killed the reserve calculations is that the reserve calculations assume the reliability of any one unit is independent of the reliability of the unit next door. What you had at Nanticoke was the classic common fault problem.

Ms. Gigantes: What happens at Pickering too.

Mr. Fisher: It was the same problem and it happened in all the plants. The probability of that happening, if you assumed each one was independent, was really quite small.

Ms. Gigantes: But if they find the boiler straps Pickering are weak, they are going to shut the plant right down and they are going to fix all the boiler straps, February or no February.

Mr. Fisher: That's true.

Mr. J. Reed: Am I correct in assuming that through all of these scenarios—the soft, the mushy and the hard path—you have made the assumption electric power generation will maintain its status quo in relation to its competitiveness, vis-à-vis other energies? There is no consideration in any of those calculations of a change in the relative competitiveness?

Mr. Fisher: Can you hold that and we will come to it. We are going to present a couple of scenarios in a couple of minutes.

Ms. Gigantes: Can I go back just for a second? If we assume there was some problem at Nanticoke that knocked out 4,000 megawatts for a short period of time—maybe all the coal is frozen, whatever it is—if we assume that for whatever reason there might be two units down at Pickering, we are up to 5,200 megawatts gone on a system that is going to need 16,000 megawatts. Suddenly we are over 25 per cent.

Mr. Fisher: That is right, we are at the moment. Let me think about that for a minute before I say yes, because that may not be true in relation to the total system. Fifty-two hundred, in fact, it is close to 25 per cent. However, you can extend the possibility and say, "What about three units at Pickering?" and then you would be over. If you say the system today is 23,000 or 24,000 megawatts, a quarter of that is just over 5,000 megawatts anyway.

[11:30]

What's happened recently that would make you wonder about any of the scenarios we looked at before? First of all, how is demand holding up this year and what have we learned in the last year that would help us answer the question about the need for electricity to substitute for declining oil supplies in the future?

On the first one, in terms of the forecast, this year is reasonably close so far to what was anticipated. We show a quarter-by-quarter basis, the average monthly energy and the average monthly peak. You can see the forecast was a little too high in the first quarter of this year, it was a little too low in the second quarter and it was almost spot-on in the third quarter, where it will be in the fourth quarter, who knows? But basically it is very close; it is within plus or minus three per cent and it is unlikely you will ever get any closer than that. So it is very close on a one-year basis.

I think we should remind ourselves, however, that this isn't terribly surprising because in fact they have always been good on a one-year basis, which is what this little wiggly line does. The problems recently have been

in the five-year and longer-term forecast. They forecast too low back in the 1950s, and they have been forecasting too high for the 1970s.

The other thing you should notice in this chart is that if you are too high in a year, it doesn't necessarily mean you have erred the same way in your long-term forecast, because sometimes these things are both on the same side of the line and sometimes they are on the opposite side of the line. So you can't take a very firm long-term conclusion from how they have done in the short-term forecast.

Ms. Gigantes: Is there anything you know of that means the average monthly peak between the end of February and the beginning of September of this year is higher than hydro forecast?

Mr. Fisher: The figures we have from Hydro are that their forecast has been too low. It was a little too high in January and March, it was too low for April-May and just hair or two low for the third quarter.

Ms. Gigantes: If you were going to look at what we know about the year you would say in the yearly peak they had over-estimated demand and in the trough of the year they had under-estimated it.

Mr. Fisher: That is what this would show you, although I would caution you against making that conclusion. You can make that conclusion if you want, but I look at that forecast and say they did it, they hit it. You can't get any closer than that in terms of this. As I recall, the hard number there is 0.68 per cent. To forecast a number like 16,000 plus or minus 0.68 per cent is quite good.

Ms. Gigantes: It doesn't require genius, though; it just requires repetition.

Mr. Fisher: I must say, the reason this one might be quite close is that the forecast comes so close to that time of the year.

Mr. Nixon: So it is what you are going to be using next week they are forecasting, not next year.

Mr. Fisher: Yes, sort of. But look at this one too, for September; it is tight on.

So our conclusion is that that is what the latest thing shows you.

It is accurate, but it doesn't mean an awful lot in terms of looking at the long term.

The more difficult question is to say whether there

but I thought it worthwhile to remind you, both the Hydro forecast and the ministry projection show the electric substitution will not be a major factor. Hydro explicitly recognizes oil and electricity are complements and not substitutes. It does that through the negative cross-elasticity, if you will. When the price of oil goes up, they said the demand for electricity will go down. The reason for that is a higher price of oil reflects itself in possibly a declining economy, although that is picked up in another part of the model.

But they also said explicitly that it is reflected possibly in a switchover of residential and maybe commercial consumption to gas in the longer term, rather than to oil. When you switch your home heat to gas as a general switch your electric water heater to gas as a general rule. If you recall 1976 we saw some numbers that showed that if yours was not an electrically heated home, your water heater would account for about half your consumption. So it is a large electric load that switches when you switch over from being an oil-electric home to being a gas-gas home.

The ministry projection shows that an uncertain oil future, as they called it, does not lead to more electricity. The ministry's projection does show you there is a shift from oil to electricity, but the total effect of this uncertain oil picture on our total energy consumption is such that you don't end up using more electricity, although electricity share does increase a little bit—not much, but a little bit.

Mr. Nixon: However, it can be arranged that that relationship is different. Suppose, for example, in Quebec, where the policy is to use electricity and to electrify homes for heating, as oil becomes more expensive, obviously more and more people are going to use abundant, low-cost electricity.

Mr. Fisher: Yes, they are—relatively low cost. Let's look at the prices for a second. What is happening to gas? Let me do this in two pieces.

The first thing is, it appears the prospects for gas have improved since the things we heard earlier this year. In fact earlier this year we had that estimate from the gentleman from the AERC that the Alberta gas reserves had doubled since the National Energy Board hearing in 1978. What you see from reading your business papers is that both the northern gas prospects and the east coast gas prospects do appear to be more promising than they were a year ago, which is reflected, we would say, in the price competitiveness.

If we just look at these sorts of numbers, if we just look at where we are going in price, right now at

about three cents a kilowatt-hour you are talking about \$8.79 per million BTU for electricity. At three and a half per cent you are talking about \$10.24. Oil today, my bill anyway, is 66-point-something cents, which comes to \$4.82. If the leaked document from Ottawa is right, I will be looking at 80 cents next year, which is \$5.77.

The residential rate for gas this year is around \$3.30, which is quite less on a BTU basis. The possibility is, if there is anything in that paper we read, it could stay at something close to that level. The idea is that that discount will fall from 85 per cent down to 65 per cent. At \$3.30 you are still only at a 71 per cent discount.

Ms. Gigantes: When will the election be?

Mr. Fisher: This number could be higher, but I think all the talk now is that the price of gas will not rise as rapidly as the price of oil so that we can encourage more conversion to gas, both residential and commercial.

Mr. Nixon: If you have a contract to heat your home electrically, don't you get a special rate, a bulk rate?

Mr. Fisher: You have the advantage of the declining block rate.

Mr. Nixon: The average of that is three cents--

Mr. Haugerty: It dropped from about six cents down to about three--from six cents per kilowatt down to about three cents.

Mr. Fisher: It may even get under three cents for the last bit, which is the same with gas. That is a typical residential, this one; the lower end of the block is lower than \$3.30 as well.

Mr. Haugerty: Farmers get the biggest break.

Mr. Conway: I didn't think electricity was that uncompetitive.

Mr. Fisher: It appears to be uncompetitive. It is not as uncompetitive as this shows because when you burn oil in your furnace you're losing a lot up the stack. When you turn on your electric heater in your room, all the heat goes into the room.

Mr. Conway: You get it all.

Mr. Fisher: Very little of it is lost in the wires, and so on.

Mr. Nixon: What is the efficiency loss? Is it 40 per cent?

Mr. Fisher: Thirty per cent is the number that sticks in my mind, but it might be 40 per cent.

Mr. Nixon: It depends, I suppose, on the price. Mr. Fisher: It depends on how well you've kept up your furnace, I guess. Ms. Gigantes: Yes, and how much you may use it.

Mr. Fisher: Yes, so you can't look at them directly.

In the olden days, the difference was about four to one between those kinds of numbers. Now it's in the two to one area, and as you can see, it depends on how low this number goes in relation to electricity and how competitive gas will be. It won't take long for that figure, going up 10 per cent a year, to be \$11 in the year 1981. It will be \$12.10, or a figure like that, for the following year. So the question is, how quickly will gas go up, for you to know how competitive the different fuels are going to be.

The third point we asked was, "What are the implications of the policy statement called Energy Security for the Eighties, issued by the minister?" We've just run out those numbers to say, "What do they mean?" The main features of that were that we would have target energy growth of two per cent per annum; that we would have a target oil consumption of zero per capita which, let's say, would be about a 1.8 per cent per annum growth overall. We had a goal for non-conventionals that they would get to a five per cent share by 1995.

You'll notice I'm using non-conventional, so I'm not throwing in there the additional hydraulic as well. This is the biomass, and so on. I said, "Say we said the year 2000, so we don't have to do all our calculations over again for five years."

Then what happens is that, at two per cent per annum, the energy supply grows about 1.5, four times, between 1978 and 2000. The shares from the different sources would go like this. Oil which is now at 45 per cent, would drop only to 44 per cent, because as you can see, the per capita zero is not very different from the two per cent per annum.

Just assuming that gas holds its own, although it's never stated, and oil holds its own, the non-conventional's go up to five per cent, then electricity, in fact, drops to 11 per cent. When you work out all that, it averages out for electricity to a 0.83 per cent per annum growth in electricity. In other words, as we see it, if the implication of the government's policy statement was that if you met all those targets they have set up, then in fact, you could get as much oil as they say they want that they're setting as their target, that electricity growth would be less than one per cent.

Ms. Gigantes: Jim, have you run that extrusion by the ministry?

Mr. Fisher: No. Mr. Nixon: why is it the most important slide in there?

Mr. Schwartz: They'll be running it by us.

Mr. Foulds: I would think in about two hours.

**Mr. Fisher:** Let me say what I think the ministry would say about that slide, if I were to talk to them about it. I think they would say that this is a target and we weren't going to get to it until 1985, so that the average over the time between 1978 and 2000 in fact would be higher than two per cent.

**Ms. Gigantes:** What has been our energy growth over the last couple of years? It's not much more than that, is it?

**Mr. Fisher:** No, not a lot more. In the last few years, yes.

Again, this is a target, this is a goal and its an ambitious goal; so you might end up with some different numbers.

**Ms. Gigantes:** But you haven't included Hydro in your use of those five per cent non-conventionals?

**Mr. Fisher:** No, hydraulic is in addition to that.

**Mr. Schwartz:** You've given them an extra five years.

**Mr. Fisher:** Yes, and I've given them an extra five years to get there, as Alan has said. It's their non-conventional non-conventionals. It's energy from waste, solar, wind, wood, those things. And that is set, as it says in here, a minimum goal, whatever that means.

[11:45]

**Mr. Williams:** Before you leave that, there's one projection I find hard to accept. It's the one on oil, the one percentage factor shift of 45 down to 44. That's a heck of a big assumption to make, that that kind of source of energy would be available to us.

**Mr. Fisher:** Yes, I agree.

**Mr. Williams:** That whole chart can be thrown completely out of whack if one could seriously challenge that, and I think it can be challenged.

**Ms. Gigantes:** The zero per cent growth.

**Mr. Fisher:** I agree. I think that's one that we can seriously challenge.

**Mr. Schwartz:** Those two targets and the goal are from the government's statement. On this page, I don't think Jim is making any value judgement on those.

**Mr. Foulds:** I think that should be the next part of the lecture.

**Mr. Williams:** It's just that you're assuming a status quo which is something extremely nebulous at the moment.

**Mr. Schwartz:** You'll see that we don't assume that.

**Ms. Gigantes:** It's important to underline about that chart, and that assumption, that it assumes that we will get to zero per cent growth--

**Mr. Fisher:** In oil.

**Ms. Gigantes:** --in oil.

**Mr. Fisher:** We have to do better than that. We aren't going to have that much oil.

**Mr. Chairman:** Implicit in the ministry's calculations is that we're going to be able to substitute, presumably from Canadian sources, what we don't get, or might not be able to get, from off-shore sources if you're going to keep at the same level. Am I right?

**Mr. Fisher:** Yes.

**Mr. Schwartz:** It must be implicit.

**Mr. Conway:** Can you help me in the per capital oil consumption growth in this province in the last three years? What has it been?

**Mr. Fisher:** I don't think I could tell you. I don't know if anyone has the numbers in the last three years that are that precise, but I could look and see what I could get.

Going away from that, what could you say might be a logical case based on what we have seen? Alan and I think you could say that a fairly good case could be made for two to 2.5 per cent as a growth projection for the next 20 odd years, based on these kinds of numbers. It would be average energy growth of two to 2.5 per cent. Let's assume you don't get down for the imports. It may be higher than you thought for anyone of a number of reasons.

Let's suppose that the oil growth will be at about the NEB rate, which is 1.5 per cent or even a little less, which is 1.25, because you're more concerned than, possibly, you might have been about the imports. In that NEB rate, of course, in that 1.5 per cent, there are a lot of imports.

Let's suppose that gas can do a little bit better than the NEB thought it could a year ago--not a lot better but a little better anyway. Let's suppose that you can get your non-conventionals to grow, maybe not to five per cent--maybe there--but maybe to four per cent by the year 2000, because it's a very large growth to attain for an industry that is just starting. Let's suppose that coal keeps its present kinds of uses, that we don't change or have to shift to something else because enough coal is available.

If we take these numbers here as the supply today, and we look at those two growths, the two scenarios, one's in the middle, what we're saying is that in a two per cent overall energy growth between now and the year 2000, oil will grow only at about one per cent and a quarter per year--which is less than the per capita in the growth population--that it will decline to about 38 per cent share, or about a 7.0 drop.

Gas can fill a gap there, growing less than the NEB projection. It will go to 33 per cent and you will get three per cent; coal will grow at two per cent and get to 10 per cent, and the non-conventionals will grow essentially, at an infinite rate to get to a four per cent share by the year 2000. That's what balances it out. Electricity, in that case, only has to hold its own.

If you thought about whether there would be a shift in this, just talking about this one, it's most probable, in our view anyway, that with the kind of prospects of gas and the amount of gas that's available, the price of gas will hold down the growth of the non-conventionals. The various non-conventionals will not be able to be justified on a cost basis, so you might see this one growing a little higher.

But supposing, instead of a two per cent overall you got 2.5 per cent overall energy growth between now and the year 2000. In this particular one, this being a higher scenario, we said, "Let's allow the oil to grow at about the same rate as the NEB said," which gets it to a 36 per cent share which, in fact, is a drop of nine per cent from where it is today. Gas would then have to grow at about 3.04 per cent. The last NEB report, just for comparison, had it growing at about 2.91 per cent. So this is a little more than the NEB is saying it will grow. We don't think it's an unreasonable number.

Again, we've held coal and we said, "Suppose we do a little better on non-conventionals." Then again, all electricity has to do is hold its own and we still have a balanced perspective.

Mr. Chairman: These figures, coming back to John's query, represent what would appear to be a more realistic assessment for oil, namely, it's not going to hold its own, it's going to drop.

Mr. Fisher: Then our per capita consumption will not be maintained. That's right.

Mr. Schwartz: Then it's important to say, as Jim has said, that these figures are a logical case from what we've heard and what we know. But these figures are figures that we plugged in. I just wanted to make that clear.

Ms. Gigantes: You'd plug in the various combinations in those figures?

Mr. Schwartz: Yes, you can do what you like. You can say that oil is going to grow by 20 per cent if you like.

Ms. Gigantes: We can say it would go down by 20 per cent, too.

Mr. Fisher: Yes, you could say it would go down,

one per cent in here, then you'd have to reallocate what you do and that, I think, would show you that electricity would have to go up if oil does that badly.

Ms. Gigantes: It depends on the prices that are involved, and what the concurrent price of gas is, and what assumptions you make about the effect on the non-renewables, the non-conventionals as you call them.

Mr. Fisher: Yes.

Ms. Gigantes: But this is the same game that everybody has played before, I suppose, in the last four years. Mr. Schwartz: All we're trying to say here is that this appears to be very logical and reasonable in relation to all of the numbers.

Ms. Gigantes: As logical and reasonable as anything else?

Mr. Schwartz: As anything else, yes.

Mr. Chairman: If the low price of natural gas is likely to be a disincentive to meet these goals for non-conventionals, I suppose the implication of that in terms of public policy is that there will have to be that much more incentive, taxwise or otherwise, to be able to meet these non-conventional goals? In other words, you'll have to compensate for the competitive position of gas in order to bring non-conventionals in there.

Mr. Schwartz: I think that's right.

Mr. Schwartz: Yes, that's right.

Mr. Fisher: It's the right phrase. It would have to become more of an arm of public policy.

Mr. Fisher: If, in fact, you wanted them; because I think the implications of this are that if the higher prices of energy, and the concerns about its long-term availability have led us to an era of low energy growth rates at a time when gas is going to be relatively abundant and not too expensive--

Ms. Gigantes: Which is a large assumption.

Mr. Fisher: --the non-conventionals are going to have a really tough time getting in the road.

Ms. Gigantes: Within that same framework, you could make another assumption, which is that the price of gas relative to the price of oil maintains the same gap as now at 85 per cent, say, for five years or for 10 years, in a public policy choice, to allow time for people to use gas but to give the market incentive to the development of non-conventional resources.

Mr. Fisher: It could be. One could make the argument that the pure economist argument would be that gas should be priced at something competitively on a BTU basis if, in fact, we had an opportunity to sell gas to the United States which may require it, and be willing to pay those kinds of prices. The best thing for our country

would be, if you're an economist and wave your magic wand, to have gas in this country priced at that price, so that we would get the export earnings and we would encourage the growth of these kinds of industries, and the whole world would be better off for it. Whether you believe that or not is up to you.

Ms. Gigantes: If the pure economist were to say that, he would have to develop a unit of scarcity and be able to attach that unit to each of the supply forms, otherwise he wouldn't say that.

Mr. Fisher: In theory, of course, that's what the price would do. As it becomes more scarce the price goes up, which he knows.

Ms. Gigantes: As we see it, which is the way it really happens. As the price goes up it becomes less scarce for us.

Mr. Fisher: Although in oil you have a classic situation which is that Middle Eastern oil is very cheap to produce and very expensive to buy because it's scarce. Ms. Gigantes: There's nothing classically economic about what's happening in energy supply.

Mr. Fisher: In energy, yes.

In one page, the summary of what we see today and the major conclusions we draw from it, which are on this slide, are that in March the committee looked at these numbers and the consensus was that the growth in demand was likely to be about two per cent to four per cent a year. Today, looking at what we have seen today and have seen in the last few months, we believe two to three per cent is a better range than two to four per cent, and that this kind of range has very serious implications for the planning of the electric system in Ontario for the Darlington station and beyond.

Mr. Foulds: Before you go further, Jim, on this page you are talking about the growth in demand of electricity only?

Mr. Fisher: Yes, electricity only.

Mr. Fisher: This is electricity only.

In our view, if you accept the two to three per cent range, which Alan and I think is the most reasonable range to project on, the Darlington station can be no longer justified as being needed "just to meet the growth and demand for electricity." It can be justified in one of two ways. It could be justified on a cost basis because one could say it will be cheaper to build Darlington and run it and thereby be able to mothball 3,400 megawatts of conventional fossil generation than not to build it; therefore, one should continue.

Ms. Gigantes: You mean Nanticoke?

Mr. Fisher: It would be Lakeview, or probably one of those.

In a sense, that's a decision. If you could say that the Hydro decision to add capacity has always been the forecast or the economic, we don't think they can justify it on a forecast any more although they may be able to justify it on an economic basis. We haven't seen that.

The only other reason you could have for maintaining the Darlington schedule is if you maintained it on the basis of some provincial economic priority because either: you want to maintain jobs in the current economic situation; you thought it was important to keep the nuclear industry in Ontario alive so that it would be there for ourselves and for export possibilities in the future, or you said that as a policy Ontario wants to provide some insurance against other energy problems so we should keep building it and have it there as a backstop.

Mr. Nixon: What kind of a possible meaning would insurance be in that regard? It couldn't mean you would need it to replace the loss of electrical energy. Could it mean that it might be an economic provision for export?

Mr. Fisher: I would say insurance might be against this kind of possibility, that we don't get our total energy growth down as low as we thought we could--that in order to have any kind of economic growth we have to use more energy than most people today think we are. That would be one.

Mr. Conway: Just to interrupt there, Jim, that's a very significant qualifier of the point that you made earlier about Darlington not being justifiable on forecast grounds.

Mr. Fisher: That's right. I'm just saying this is insurance. I'm saying that we're forecasting, we're projecting and we're saying, "What if your projection is wrong?" I'm saying, "What are the two most important things that you could say you might want to have insurance against?" One would be that you think your overall energy forecast--

[12:00]

Mr. Nixon: Was grossly out of the ball park.

Mr. Fisher: --was out of the ball park.

The second thing you'd say is that possibly other provinces would hold you to ransom on their gas and that you maybe should have more room than the total supply situation might necessitate.

Mr. Williams: Didn't Dr. Porter in his assessment justify Darlington not only on an economic but on a forecast basis?

Mr. Fisher: Yes. In the interim report, Dr. Porter thought electric energy growth would be around four per cent by the year 2000. On four per cent, Darlington is justified by the year 2000--and one more besides.

Mr. Williams: Which means if they keep going full tilt they might have it operating by the year 2000.

Mr. Foulds: What you are saying is there is an enormous difference between a three per cent growth rate and a four per cent growth rate.

Mr. Fisher: Yes, there is. There are enormous implications between those two numbers.

Mr. Foulds: That's 25 per cent.

Mr. Fisher: It's a very big difference. That, of course, was an interim report and we don't know what Dr. Porter is going to come out with in his final report, when it comes. If he stays with a four per cent number, then Darlington will be justified on a forecast basis, in his view. If he comes out with a lower number, then the Darlington station stands out there very alone.

Mr. Williams: Of course, the downgrading of the forecast factors, I don't know if too much emphasis is being put on whether it is being used as a cornerstone in all these projections. The current economic slump and slowdown certainly has a profound effect on the very short term. This is the most difficult thing of all to forecast, where the economy will sit even two or three years from now. Does it stay in the doldrums as it is now or will it get worse or better?

Are your projections largely founded on the current economic slowdown that has really been a significant reason for all the projections being lowered in recent forecasting?

Mr. Fisher: Our projections, and I think all the projections we showed you, are based on the economy recovering over this period, on its not being a depressed economy at all, that in the long term it will grow at about the rate of growth of the increase in the labour force, plus some long-term rate of growth in the productivity of the labour force.

The economy in the long term is assumed not to grow quite as rapidly as it has in the past, because we don't think the labour force will grow at quite the same rate.

Mr. Williams: You are using the same basic considerations you used--I think you had charts on this subject--earlier in the hearings.

Mr. Fisher: Yes, that's right. But we are not assuming a continuing economic slump.

Mr. Nixon: I want to know really what the implication of the page is. If we accept the information leading up to a conclusion, which seems reasonable, that

the growth rate is between two and three per cent instead of two and four per cent, it says that therefore the present schedule can't really be maintained. What would an appropriate new schedule be, since it has already been moved back a year? We are not saying this thing means Darlington is not needed--

Mr. Fisher: That's right.

Mr. Nixon: Are we talking about saying we can reduce the completion date of the first reactor for four years?

Mr. Fisher: Our very preliminary numbers show you that at three per cent we are looking at the completion of the last unit in the year 1996.

Mr. Nixon: But is that the last of four units?

Mr. Fisher: That's the last of four, that's right.

Mr. Schwartz: It is now scheduled to be completed in 1990.

Mr. Nixon: In 1990. Does it follow that the whole thing could then be adjusted by five to six years?

Mr. Fisher: Not necessarily. You would have to work it out more precisely.

Mr. Nixon: I think we ought to know what the implication is, other than that it would be not only possible but very sensible to delay it substantially. We ought to know what that means.

Also--the first caving--the only way it could be justified is that it is cheaper than one of the current fossil-fuel plants. What would the reasonableness be in saying that Darlington would be so much more efficient than Lakeview that we could keep Lakeview there for an emergency and transfer all of that to Darlington over a number of years? What would be the significance of that, when you take into account the cost of the capital required? Is there efficiency gained? There is every indication that there isn't.

Mr. Fisher: We don't know that.

Mr. Schwartz: That is in fact really what I think Jim was saying: that is one of the ways of justifying it but certainly this committee doesn't have the information for it.

Mr. Nixon: And the information really isn't available because the argument is, what goes into the cost of these things? We don't know what goes into the cost.

Mr. Fisher: We do have a report that was given to us that compares a new nuclear plant with a new fossil-fuel plant. So we do know the assumptions that go into cost calculations. We have not looked at them in any detail, though, and we have not looked at the implications for a plant that is already in service.

Just thinking about the prospect, it seems to me what you have is two things. On the face of it you would say there isn't any way that that could work out, that a plant being built through the 1980s, with the probable inflation rates we will see through the 1980s--the significance of that first thing is, if you have a nuclear plant it is cheaper to run it than if you have an oil plant. But it is not possible to say, and it seems unreasonable to think, that you should build a nuclear plant to replace an oil plant.

Mr. Fisher: Just thinking about this thing, that is what you would say on the one side--that it's unthinkable. The other thing that balances it in our particular situation is that we know one of the major cost components of a nuclear power plant, a Candu plant, is the heavy water cost. We have an oversupply of heavy water so it is almost free, if you will. If you started to factor that in--

Mr. Nixon: It's cheaper than Perrier.

Mr. Fisher: Yes, cheaper than Perrier. It's probably cheaper to use and it saves storage costs.

Ms. Gigantes: Again, you are not dealing with specific figures there. We are making an assumption that because we have overcapacity we might as well use the overcapacity. But the process itself is a very expensive one and uses a lot of electric energy from Bruce.

Mr. Fisher: It does use a lot of energy. But suppose it is nuclear energy that can't be used in any other way.

Mr. Schwartz: The energy is there.

Mr. Fisher: It is energy that is there. You have got four 850-megawatt reactors that are only 750 megawatts electric, so they do have spare capacity to produce steam. Suppose you said it was virtually free. We are just speculating on what the thing could do, this is something we have not looked into but is look-into-able.

Mr. Nixon: At one time we also had a superficial review of the possibility of exporting. It seems to me that may have changed considerably, although the facts were there, by the Baie James stuff coming on stream. They're really going to be selling a lot of power. We cannot compete with that, price-wise.

Mr. Fisher: I don't know if we can compete with it price-wise, but I think what we did find out is that there are other problems. There are transmission problems through our neighbours. There are overcapacity problems that our neighbours have. Quebec has a transmission line that takes it right down into New York City, I think, which makes a big difference. We don't have that.

Mr. Schwartz: The point Jim made is that this issue of whether it would be cheaper to continue to build Darlington and to mothball another one of the plants is something that can be looked at in a relatively short space of time if the committee wants to look at it. I don't mean this week, but in January, for example, it is possible to look at that if that is what the committee wants to do.

Mr. Haggerty: Isn't it also the case though that these plants that are in existence now--say the fossil-fuel plant at Lambton, which has been in service maybe 10 or 15 years--by the year 2000 these plants become obsolete. They are worn out and you have to replace them anyway. I think the life span of these plants is maybe around 30 years and they are going to go anyway.

Mr. Schwartz: That's what you'd look at. Those are the kind of factors you'd consider.

Mr. Chairman: In that context think of Keith, which was allegedly the most out-of-date plant in the world. They spent \$36 million and presumably it's now back in the game.

Ms. Gigantes: We're assuming that Pickering will be still be operating in 2040. But you just spent the money on it to bring it up.

Ms. Gigantes: Mr. Chairman, obviously the staff has put a lot of work into this and identified a number of important questions for us. Without asking them immediately to be able to answer every little piece of economic and predictive questioning that we might have, I wonder if it would be possible just on page 32 to get a couple more figures that might help us. I'm thinking particularly of the gross provincial product growth overall for the last two years and the energy growth rate overall for Ontario.

I know when we're dealing with the energy growth rate, which is difficult to translate into the kind of figures that we were looking at on a share-by-share basis on page 31. But I wonder whether we could have some sense from them of really what they're talking about in terms of end use of energy demand growth rate at the secondary level. We skip, as always in these forecasts, from the primary demand--which includes the inefficiencies of electricity--to this secondary demand from which maybe we should choose to remove the inefficiencies of electricity. That would have an enormous impact on our projections of what a gross primary-energy demand growth rate would look like.

On page 32 again, when we look at the questions of provincial economic priority and we talk about maintaining jobs associated with Darlington specifically, because that's the question specifically before us, how many jobs will that be? I don't mean man-years of work; I mean how many jobs it will mean in a given year, that kind of thing. Is it possible to break that down in any realistic kind of way?

Mr. Fisher: We have some information around that. We might have that specifically but we do have something on that.

Ms. Gigantes: If you could just take a look.

And on the question of keeping the nuclear industry alive, will it really stay alive in Ontario if we only build Darlington to the year 2000? Can we make an assessment of that, because we were told that we're going to have to build a new reactor every 13 months I think to maintain a domestic nuclear industry.

Mr. Chairman: Through to the end of the 1980s. Mr. Foulds: One inside and one outside the country in fact.

Ms. Gigantes: I can't even remember what the figures were but it sure wasn't just one Darlington.

Mr. Fisher: Yes, we do have the Leonard and Partners thing on that. We could look at that, we could get something.

Mr. Curetz: If I could interrupt for a moment, I'm sure staff would have to take into consideration the impact that Darlington would have for--do I dare say--possible external export sales, which would probably be difficult to grasp in figures.

Ms. Gigantes: You couldn't quantify that. I don't see how anybody could quantify that. We either assume there are going to be sales or we assume there are not going to be sales. We'd have to look at the two propositions and look at the domestic impact on the nuclear industry.

Mr. Curetz: At least look at them.

Ms. Gigantes: But I don't think we can estimate a probability for those things.

Mr. Williams: A further interruption if I just might. We're sitting to 12:30 and come back at two?

[12:15]

Mr. Chairman: Evelyn is about to finish. Julian has questions and in accordance with the earlier announced schedule I was going to propose that we then adjourn and come back at two. Mr. Williams: A couple of us have meetings to attend now.

Mr. Chairman: You're free to go now.

Ms. Gigantes: The last question I'd like to raise on that final page 32 is with "providing insurance against other energy problems." Because the range of possibilities in which you consider whether to build a Darlington now or not build a Darlington now or never build a Darlington includes so many different kinds of questions, is it possible for us at least to identify what those questions might be? What are we thinking of insuring against? Could we just get a list of them so we can consider each in turn?

Mr. Schartz: You won't get an exhaustive list--

Ms. Gigantes: No, but I think it would be helpful to focus us.

Mr. Nixon: Really, they put that in there almost saying that if somebody decides to build it, it would have to be for reasons that don't compute.

Ms. Gigantes: The other point I'd like to make, Ms. Chairman, is that at Darlington, as I understand it, they started scratching the ground and don't have a licence to construct or whatever the APCB calls it. Did that start about a year and a half ago?

Mr. Fisher: That's right, yes.

Ms. Gigantes: And by December 1978, \$500 million worth of contracts had been let. The problem of leaving it until January is that by December 1979 there may be \$1 billion worth of contracts let. I think we should be considering whether we should make a recommendation that has to do with just letting any more contracts for the moment until there's further examination.

Mr. Schartz: Why don't we talk about that after?

Mr. Chairman: I think that's anticipating our discussion. Julian did you have points?

Mr. J. Reed: I just have one area of concern that I'd like to bring up at this time regarding the need for Darlington. That gets back to the competitiveness of the nuclear generating plant itself. We have made the assumption here that we are going it alone in terms of electric power. Yet I wonder whether we are missing one great area in terms of insurance and that is the Baie James potential and the potential that is available when you might decide you want to buy the milk instead of buying the cow. Maybe the cow is too expensive.

I only put that in because I think it should be one of the considerations if we're making a decision on proceeding into the 1990s. There are inflationary costs, there are increases in costs of building plant, and the cost per kilowatt-hour coming down the wire rises accordingly.

It was mentioned a little earlier this morning about our relative competitive position in terms of the

Baie James for export to the United States. I think it's also a worthy consideration in terms of whether or not we are simply electing to pay a premium for electric power from a nuclear source here rather than perhaps considering that option.

I know Ontario Hydro has let contracts lapse in the past and I know there have been difficulties, but there is a tremendous energy potential. Mr. Chairman: Over 60,000 megawatts. Jim, you had a question?

Mr. Foulds: Yes, what you've thrown out at us on this page is a hell of a lot of questions, really, rather than—if I may be so blunt—major conclusions. You've thrown out this conclusion that there are a lot of questions that need to be looked at.

Mr. Schuartz: Based on one major conclusion and that is, the growth rate of electricity will be three percent or under.

Mr. Foulds: Do you have any idea how long it would reasonably take to look at the questions my colleagues have raised this morning and come to some reasonable conclusions?

Mr. Fisher: How long it would take to do this?

Mr. Foulds: Yes.

Mr. Fisher: Two or three weeks probably.

Mr. Schuartz: With the big time being spent on that. That will take some time. This one will take some time for somebody to do some work on. It will take very little committee time once it is put together. Is that right? This one will take more committee time.

Mr. Foulds: I'm just thinking about time frames and committee work before we come back this afternoon and start talking about this, and it seems it certainly can't be accomplished on a one-Wednesday-a-week schedule while the House is sitting for the next five or six weeks.

Mr. Schuartz: No, I don't think it can be

accomplished before the House breaks.

Mr. Nixon: We're talking about it future use of time and so on. These recommendations are based on quite an elaborate set of hearings. They could lead us simply to recommend that the growth rate should be adjusted somewhat and that the direct response from this is that Darlington, in fact, should be postponed for six years. We can take that forever as to the various alternatives. I think we've done enough on that.

Mr. Chairman: Could I ask the staff a question that they could think about? I've had a feeling, if I may put it bluntly, that we have been conned a bit by the argument that every time a nuclear plant has to be shut down it costs X number of millions of dollars because you bring in coal.

I have never seen a calculation to indicate what the cost is by leaving that coal-fired plant idle. In other words, there may be a net saving but I don't think the saving is \$200 million or \$300 million if it down for a year—figures we often got. Is it possible to get that kind of thing?

Mr. Fisher: We can do something on that.

Mr. Haggerty: That raises another point. In testimony by Hydro they indicated there were about 17 hydraulic plants they could look at that could provide us with about 4,000 or 5,000—

Mr. Chairman: Two thousand.

Mr. Haggerty: I think it's higher than that. Mr. Chairman: No, 17 or 2,000 in the minister's statement.

Mr. Haggerty: I thought it was higher than that. We should take a look at that too, because if you're talking about delaying Darlington, if they get into renewable resources that can create jobs too.

Mr. Chairman: In other words, a small margin more could be met not by building a giant but by building—

Mr. Foulds: There was a detailed statement a year ago August on the hydraulic plants in particular. As I recall, one of the problems with them is they are so widely dispersed and in areas that can't be plugged into the east system. That is something we should be a little bit careful about.

Mr. Haggerty: Surely if you can get 20 megawatts out of Ropighton and work it into the grid system and that is important in that area, then surely to goodness—

Mr. Foulds: Except, Ray, as I recall the minister's statement a year ago August, most of those hydraulic alternative sites were small places of five, 10, 15 or 20 and were spread to the far north of the province.

Mr. Chairman: If there are 17 of them and they're going to get 20 megawatts, their average is over 100.

Mr. Foulds: Except that they're clustered. The one at Ear Falls I think is the biggest one.

Mr. Chairman: Bob, do you have a question?

Mr. Mackenzie: I'm not sure it's a question, it might be in an entirely different direction and I don't know if it's within the purview of this committee, and that is what I think is the rather desperate need for jobs in secondary manufacturing in this country. Is one of the roads we go to make some suggestions in terms of what and how do we get those jobs and make use of the excess capacity we have?

Mr. Nixon: That will take about a year and a half.

Mr. Chairman: Okay. We will return at 2 p.m. with a full discussion, I hope.

The committee recessed at 12:25 p.m.



## LEGISLATURE OF ONTARIO

## SELECT COMMITTEE ON ONTARIO HYDRO AFFAIRS

WEDNESDAY, OCTOBER 24, 1979

The committee resumed at 2:17 p.m. in room 228.

SAFETY OF ONTARIO REACTORS  
(continued)

Mr. Chairman: May I have some guidance from the committee as to how you feel it would be best to try to handle this afternoon? I suspect that most of our discussion may focus on the conclusions, but there may well be earlier pages we will want to discuss. Do we try to flip through it page by page until we get to the conclusion, or just dive in with whatever topic anybody happens to raise in a sort of unsystematic and conceivably overlapping fashion?

Mr. Nixon: We will have to go over it all again for George.

Mr. Chairman: Yes.

Mr. Nixon: If you want a comment, I really don't think it is necessary to go over it page by page.

Mr. Chairman: I would hope that is not necessary, from the staff that the growth rate, instead of being two to four per cent, should be amended by this committee to two to three per cent is our recommendation. If we accept that, then we should point out that this also means that Ontario Hydro should postpone its date for Darlington

coming into first service to 1996. George wants to get in, but Evelyn just to help him tune in, having heard from Bob, Evelyn, if you have a comment, then I will give George the floor because he was not with us.

Mr. Nixon: The only other thing I want to say is that, of course, this is not the only aspect of our recommendation we have to deal with. This is rather an ancillary thing that was somewhat tacked on at the end of our report in our last discussions. If there is some thought about getting a report into the legislature soon, we ought to also look at the words that were—I mean we have already seen one recommendation, or a fairly clear recommendation about safety and certain things like that. We advised our counsel of certain changes in that regard.

Mr. Chairman: Just a moment. This raises another point that perhaps I should have mentioned earlier, although I suppose there wasn't really a legitimate occasion for it.

The staff has the view, and I must say I share it, that we are dealing with apples and oranges, so to speak, two different topics, and that what we should make are two separate interim reports. Whether they go in together or whether we stagger them in presentation to the House I think depends on how quickly staff can get the drafts to us, and we can put our final imprimatur on them.

Mr. Nixon: The draft for the special reference on atomic safety should be pretty well completed, I would think, because we really had all the ideas, if not all the words, presented to us before. The reaction from the committee and from individuals in the committee was for certain changes in emphasis and additions and so on, which I would think would be a time-consuming job, but that is really the special reference that we had. This recommendation is based on the general work of the committee.

Mr. Chairman: But to tidy this point up now and then we can get back to what is on this afternoon's agenda. The staff had indicated to me earlier that because of a request on the part of the committee that each one of the recommendations should be prefaced by a meaningful amount of explanatory material so people reading the report would not have to take for granted all we take for granted having been through the committee and its hearings, it was taking a little longer.

Compounding that problem was the fact we threw in this recap and synthesizing and updating of the earlier work, so how soon is staff going to be in a position to give us a draft on what was this summer's work? What is your feeling now, Jim?

Mr. Fisher: Our target would be that if we could just work flat out on the nuclear thing in about two weeks we could have a preliminary draft of the whole summary of the summer hearings and your recommendations, but it will take that long. If you read the transcript of the discussion, there is an awful lot of stuff you will want to include.

Mr. Nixon: Surely you're way past that. In the last meeting we had in the summer series, you gave us an overview like this of what you felt—and we largely agreed—what we had discussed and the conclusions we had drawn. I am not in a terrible rush for that, but I don't know whether that should be as big a job as that. I thought that really you had done a great job in providing us with that overview, and to go back to all the transcripts again maybe is superfluous.

Mr. Schwartz: In many cases the committee asked us quite particularly to provide a lot of backup information, et cetera, and when we reread the transcript of what happened that day, while it is true we have the outline on

an almost paragraph-by-paragraph basis, it turns out it just takes a lot of time to put in all the things we thought the committee wanted. It is time-consuming, and unfortunately—I won't say unfortunately, but what happened, of course, is this sidetracked us a little bit. I am not sure if that is unfortunate.

Mr. Nixon: Actually, I thought you were going to do the other and do this if you had time. I think it is very important.

Ms. Gigantes: I don't think you should be complaining now.

Mr. Chairman: The staff has indicated that in order to fulfil the wishes of the committee you have a full text, not just sort of conclusions without any of the preliminary footnoted leadup to each of the conclusions, it would take the better part of two weeks.

Ms. Gigantes: We have no time to debate the report in the House before two weeks from now anyway.

Mr. Chairman: Let's cross our bridges as we get to them. I agree that may well be the case, but then we will come back on Christmas Eve and debate it then, or New Year's Eve maybe as an alternative.

Mr. Foulds: We are going to adjourn on December 11, Mr. Chairman, and going to resume the House in January. That is my prediction right now.

Mr. Chairman: Can we now get back to this report then? You had a comment and then, George, hopefully you can—

Ms. Gigantes: Instead of making a motion right away, because I don't want to sort of try to put our ideas in too formal a context at this stage, I would like to add to Bob's comments and suggest that we can take it a bit further. Instead of just saying that we now recommend that the growth rate looks like two to three per cent and that Hydro should adopt a growth rate of two to three per cent and plan around that, it seems to me that dealing very specifically with the question of Darlington we can look at that question in particular terms.

We know that the work has begun on the site. There isn't a construction licence yet but we have been told that is not going to be a major hangup. We have been told that by the Atomic Energy Control Board.

We know there is a year and a half of work of one kind or another that has been going on there, and we know that as of December 1978 there were \$500 million worth of contracts for equipment to be supplied, I guess systems—I don't know what was involved in total in that \$500 million worth, but it seems to me that we could make two further points in a recommendation.

One is that the government should, as quickly as possible, lay out to us whether or not it agrees with the

conclusions that we are coming to here; in other words, that the government say what growth rate it is expecting and that the government provide us with an explanation of why we shouldn't recommend—it is a complicated way of putting it.

I am suggesting we recommend that no further contracts be let until, one, there has been a statement of government policy concerning the reasons for proceeding with the particular schedule that Darlington is now being built on and, two, if the government decides to go ahead with Darlington in spite of agreeing with those kinds of growth predictions, if that turns out to be the case, why it would choose to do that.

I think we then should also recommend that this committee have an opportunity in January-February to go back over this material, the government statement of policy, and look in more detail at the questions that were raised around this room this morning concerning substitutability, concerning insurance, concerning all the various questions we raised during the morning session.

Mr. Chairman: I am a little concerned about coming to conclusions before we have had this afternoon's discussion, and I want to let George in because he wasn't here this morning.

Ms. Gigantes: That's why I didn't make a motion, Mr. Chairman. I just wished to expand on Bob's comments, think if we had our discussion before we started to try to formulate what conclusions and recommendations we are going to make it might be having the cart ahead of the horse, or the horse ahead of the cart, whichever is the right way.

Ms. Gigantes: It helps to focus though.

Mr. Ashe: Mr. Chairman, really some of the things that Evelyn just said I agree with. I am not quite sure that I am going to agree with her motion, if and when it comes, but some of the reasoning that was just mentioned I do agree with. I think you touched it there, too, when you talked about the cart before the horse.

If there is anything that has disturbed me, and I thought I had put it on the record the last time around, but I guess my impression of what came out of the last meeting of the committee some number of weeks ago, and I assume the majority of the committee and obviously the staff was somewhat different. Frankly, I thought still the priority of the staff was to get the other report finished and, secondarily, to have a look at some of these other things and maybe come back to the committee with some thoughts, some updating and what have you.

Undoubtedly, the perception of the staff—I was quite probably wrong myself, and I acknowledge that--was

to the contrary; that their main priority of time and effort was to do this and eventually get back to the other. I really do think we are mixing apples and oranges. I think the committee put in generally a good summer, came to some conclusions based on a good staff summary and report, and now we are muddying the waters and belittling the significance of that report by not getting it finalized and tabled at the earliest opportunity. Debate time is another question and I appreciate that may or may not be a problem, I don't know. I am speaking in terms of the legislature debate.

But to delay and further delay and further muddy the waters with this—I am not saying this isn't important. I think everybody acknowledges when we left it in the winter we knew we were going to come back to it. Nobody disputes that, at least I sure don't. But I really think that we would be making a mistake to do detail this in at this time, either as part of the same report, which I think would be an absolute mistake, or even to do it as a second report.

I think there are all kinds of things, maybe including a statement from the government, among many of the reasons which, frankly, are only touched upon in this document, and some of the things that I think even have changed since the spring. Even acknowledging that these reduced figures quite possibly will be in the better range, looking at, for example, the availability of the power source to the grid, examining those possibilities, we have transmission problems in certain areas. Some of them are going to take many years to overcome. The transmission lines out at Bruce A as an example, that has been going on what now, Julian, seven or eight years? Something in those lines. That is just one example.

Mr. Conway: A lot of government foolishness under the bridge.

Mr. Ashe: It has cost the consumers of the province a lot of money, I will acknowledge that. You can put the blame where you wish and I will put it where I wish, but there is no doubt it was costly.

Interjections.

[2:30]

Mr. Ashe: The supply problems up in the Ottawa Valley, these are a transmission problem.

Mr. Conway: We don't want Evelyn freezing in the dark.

Mr. Ashe: So we should be looking at those things. The other thing we have to look at in more detail, and I know it is touched upon in here, is the

implications and the cost benefit of a new plant and even in fact more mothballing of existing plants—some of them possibly even in the way of a permanent mothballing, so that except for extraordinary circumstances they may never get reactivated again. I think that's something else the committee should look at in much more detail and much more seriously.

I think we have one other pronouncement. You can't have it both ways in terms of arguing for other fuel sources, but I think we now have a little greater expectation of interim substitutions, more so than we had even a few months ago, particularly with the most promising pronouncements from General Motors on what the company sees in the way of electrical cars in terms of penetration of the market by the latter part of the 1980s. I don't think any of our projections, whether they were from Hydro, the ministry or the committee, took that into consideration. I don't know whether we can very realistically or reasonably put any numbers to that, but we are talking about this same time frame, really, in the next decade.

I think to come up with a report with all of these things left hanging would not do justice to the way the committee has handled all of its deliberations to date. Frankly, on that basis, what I am saying is that we should come to some conclusion as quickly as possible. I frankly hope it is to maybe leave a series of questions that the committee wants to see in more detail at the appropriate time—I think that's probably January—and secondly, to give instructions to the staff to put all their time and efforts into finalizing their perception of the committee's report and get it back to the committee as soon as possible, and hence get it finalized and tabled in the Legislature.

I think it does justice to what our main priority was this summer to get that finalized. I think it does more justice to the committee in the way it has conducted itself in the hearings, and the various issues it has looked at in the last two years.

Mr. Chairman: I have a list, and I'll tell you who is on my list in a moment. But may I suggest that what we want to clarify at this point is the procedural problem of two reports and how we are going to handle them. Surely this, in that connection, is obvious; we have this afternoon to discuss this and what we want to do with it; whether we have recommendations that flow directly from it, or whether we have, in George's alternative scenario, a number of questions that we want to raise and leave it to January. We should get at that as quickly as possible this afternoon.

I would assume that having done this this afternoon, we will go back and put top priority on a report on the summer hearings on nuclear safety, or whatever you like.

My list is: Bob Nixon, Julian Reed and Evelyn Gigantes.

Mr. Nixon: I think it would be irresponsible for us not to make a report to the Legislature on the expected rate of growth of the energy load and its ramifications for the building program of Hydro.

The second point I want to make is that the field of information pertaining to this is growing faster than we can examine it. There is not much sense in allowing us to branch off into all of the ramifications of our prediction that the energy growth rate is going to be lower than was originally expected.

Mr. Mackenzie: very properly, just before lunch, said we have to think about the ramifications of the possible postponement of Darlington having to do with employment and the whole economy of the province pertaining to the nuclear industry.

I agree entirely that the ramifications are great, but I do not accept the fact that this committee has the responsibility to examine those ramifications in the detail that many people would expect. Our position here, as I see it, is to give our best projection of the growth rate for electricity. What the ramifications will be for Ontario Hydro could be dealt with by another committee or a re-reference to this committee--which under those circumstances I would not want to continue on--it could be the responsibility of the government itself to look at the ramifications and base the decision on the future of Darlington on that.

But what we can tell anybody, particularly Ontario Hydro--and they ignore it at their peril--is that the growth rate, with the objective assessments that we have been presented with, is lower and will be lower than they expect, and that for the reasons of the provision of electrical energy to this jurisdiction Darlington need not proceed at its present scheduled rate.

I don't believe it's in our purview to decide that on the other hand the employment aspects are so important that we should ignore that recommendation. In my view, that is for the government or for another committee. We can certainly bring to the attention of anybody who reads our recommendation things that would certainly come to their own mind, that this has to be considered.

On point number one, I do not feel it is logical or responsible for us to postpone making a report on our view of what the growth rate will be. It is also logical for us to take it to the next step, which deals with

Darlington, which is by far the major immediate project that involves Ontario Hydro and the commitment of the consumers.

I also want to say, on point two, that I had hoped and still hope that we can get a report on atomic safety into the Legislature with as little delay as possible. There may be a feeling that the recommendations have taken that heat away, that the committee more or less indicated by its questions or lack of questions, some sort of position tantamount to agreement that the plants are safe. Obviously, that in one respect is not true.

The reason we wanted some sort of editorializing to that oversimplification of the recommendation is that we want references to the problems with the control board and two or three other specific things that I won't further bore you with, that should be in the report, so that if there are a few people who read it and are prepared to say, "Well, maybe they have a view other than that the plants are safe and we don't have to worry about it," a reasonable amount of that information is in there.

The last point is, it is not practical for us to have any extended series of meetings in the fall. Even this meeting is an extremely inconvenient one, as you know, and this has been pointed out by others. We really cannot look to having any kind of a co-ordinated series of meetings to do very much. We can read draft reports in our own time and have another meeting in which perhaps we can approve them.

Those are my views.

Mr. Chairman: Very clear statements, stated with unbbecoming modesty.

Mr. Nixon: I was going to go over them again, but I know you don't want it.

Mr. Mackenzie: Mr. Chairman, a couple of things. First, I agree with the comment by Mr. Nixon that we can't ignore the growth figures we've been given and the relationship that Darlington has to them.

I would suggest that Bob may have slightly taken out of context--if that's the word in this case, and I am not sure--my reference to employment. I didn't see the problem with employment as being one within the nuclear industry or whether or not Darlington continued with any activity there. I saw it as the fact that even without Darlington, with the completion of the other units, we've got a hell of an oversupply of hydro and that I would sure like to see some measures taken that start us using it in terms of secondary manufacturing, which is a problem in this country.

I didn't serve on this committee until we started this summer so I haven't had some of the hydro background.

but if I remember some of the figures, we had growth-rate projections as high as six or seven per cent per year not more than three or four years ago, or four or five years ago at the most. They have been dropping constantly and we are somewhere around the two per cent or slightly better now.

We are also at two per cent at the point when supposedly we're just really going to get into a major conservation program. Unless people are talking through their bloody hats, that's part of the intention and part of the necessity, as I see it, in this country. That should at least help to firm up the lower figures and I would hope, if they are really serious about it, possibly knock them down a little further. But even if it doesn't, it's very, very clear that we have, and will continue to have for some time to come, an oversupply of electricity.

I think George's arguments, as I understand them, to set aside, or wait, or hold off until January or February any decisions in this particular matter, are just out of this world. We've got we don't know how much out in contracts now; we have better than half a billion we've been told about. We don't know whether we're going to need it until x time in the future. We don't know on what basis the government is going to argue, based on the information and summary we have from our staff today, on what basis the government is going to argue, if it does argue to continue the Darlington operation.

It seems to me that what I think was the suggestion from my colleague, Ms. Gigantes, has some merit. I sure as hell wouldn't want to see us leave this until another two or three months down the road when we could have another half a billion dollars or a hell of a lot more out in contracts without knowing exactly why and for what reason we want the darn thing. I sure as blazes would like to have some firm statement or commitment from this government, at least the reasons why and what the purpose is so they are going to have to stand on those particular reasons, before we leave it wide open.

I think the staff is right and that two weeks is not too late to get the other report pulled together. I think there also has to be a recommendation on this and it has to be pretty damn solid. While I'm not saying we don't do it for ever and a day, I'm saying I wouldn't like to see them have three or four months to get another dough-out in contracts for something that we don't know why we want it yet. I think it is important that we deal with that issue.

Mr. J. Reed: Mr. Chairman, I concur generally with the comments of the previous two speakers. I have to underline the fact that the longer we let this go on the

more deeply involved we become financially and the more difficult it is to get out. Then you get into a situation where and we've been in it before in connection with heavy-water plants--you are somehow playing the devil and the deep blue sea, because does it pay to complete a project or which are you going to lose most on and so on, and you end up making a judgemental decision which affects millions and millions of dollars. I think it's imperative that we have a comment to make on this subject at this time and not to allow things to accumulate in terms of financial commitment any more than is absolutely necessary.

I appreciate the arguments of Mr. Ashe. He talks about things like interfuel substitution and it is true that there are some unanswered questions. There are some unanswered questions on the other side I might venture. I forwarded one to the chair this morning--the unanswered question about the possibility of purchasing firm power from Quebec, and how competitive will a Darlington be with LG-2 power. I wonder if we even know that. So there are arguments that we can make.

I really do feel that we have to go on with this. I realize it has cut into our deliberations on the nuclear safety system, but I think that a comment is most appropriate right away.

Mr. Chairman: I detect a consensus that we want to decide what we want to report on this that we've been considering today. I have two further people on my list, Evelyn and Jim, but if that is the consensus let's get on with the issue of what we want to report.

Ms. Gigantes: Mr. Chairman, I was going to add a couple of more comments. When Mr. Ashe talks about what we don't know that might increase the need for electricity in the late 1980s, that's correct. GM is working on one product that may increase the need for electricity in the late 1980s. We are all aware of that. Exxon, at the other end of the scale, is working on another product on which it has put out press releases within the last three months saying it will have on the market by 1983. It is a little mechanism that came out of NASA research which they intend mass producing. It costs seven bucks and it reduces the use of electricity by electric motors by an average of 40 per cent. If we are going to look at these things, there's not just GM to look at.

[2:45]

There are a lot of unknowns, I agree with you. On the other hand I think we would be unwise, I think we'd be irresponsible--I think Bob says it right, both Bob say it right--not to make a recommendation to the government now

based on what we know now about increasing the number of contracts at the Darlington site. Half a billion dollars in contracts is not an insignificant amount. It seems to me reasonable to suggest unless and until there is, number one, a statement of government policy, and number two, an examination—I don't know what kind of examination, and this leads me to my last point—an examination of what government policy is and on what basis it's made either by this committee or some other group—and here I lose track of Bob Nixon's comments because he's suggesting that what we should do in this committee as far as the question of the building program of Hydro is concerned is that we should give our best projection on the growth rate for Hydro, and that after that, what happens is somebody else's business, and that's not my view of our mandate.

He suggests it's up to the government after that point or for another committee to look at what the ramifications of such a recommendation would be. I feel it is well within the mandate of this committee, as I have understood it and I think as the chair has always seen it, and as most members of this committee have seen it, to examine the affairs of Ontario Hydro. This is certainly where the affairs of Ontario Hydro are most critical to the energy future of this province—what the building schedule is, and what the building proposal is, because that really marks out in a practical way what the affairs of Ontario Hydro are.

If we wish to have the affairs of Ontario Hydro be something else than the building of facilities for the production of electricity, then I think that's something this committee has to look at. If we want to see Ontario Hydro take on a role in developing other forms of energy for Ontario's energy future, I think this committee has a responsibility to look at it, so I don't know why Bob is backing off from this one and I hope he'll reconsider.

I personally have found work on this committee to be long and exhausting. It has been four years now since I joined this committee and I guess I have put in several thousand hours, both inside and outside the committee on committee work. I am still prepared to go, on even though I haven't always been happy with committee decisions, because I think the job is important. I think for us to give up on the essential nature of that job right at the moment when some of the most important decisions are about to be made would be to fail in the responsibility we have as legislators.

**Mr. Nixon:** On a point of clarification, Mr. Chairman, the honourable member said she doesn't know why I am backing off. I want to clarify to you, sir, and to her that I do not see my position as backing off in any

way whatsoever. I feel that in fact we ought to move forward and not obfuscate what is a clearly implied recommendation to Ontario Hydro by asking for more time for economic study.

With respect, for example, if we were to say that maybe Darlington should not be postponed but its economic impact be studied, then we should be saying, "Well, rather than use Darlington for make-work," and I am not referring to Bob's comment here, "surely it would be better to spend the money for other forms of energy not dealing with nuclear which is going to give us the branch and the bridge and so on." Instead of backing off, I feel we should make the flat, clear, simple recommendation to Ontario Hydro about the growth rate. Certainly if the committee wants to make a further review of it, that's fine, but I personally don't feel this committee should.

**Mr. Foulds:** I just have three points to make, Mr. Chairman. I think we have two reports to make. I think we have to make the report on nuclear plant safety. I feel as strongly as other members that the summer was a pretty good summer at times but I think we should complete that report very quickly before we lose the essence of the summer series. So I would certainly like to see that report completed and presented to the Legislature, because I have a feeling there may be some revision of the report that is presented to us, even in the recommended form.

I think there were more reservations about the staff report than perhaps became apparent in the last two days of the summer hearings, but I think it is imperative. We would be abdicating our responsibilities if we didn't complete that report on plant safety. The other two points that I want to make are very simple. I think this committee would be missing one of the opportunities given it if it did not take up the suggestion of my colleague, Mr. Mackenzie, and that is, if we have an oversupply of electricity, nobody as far as I can see in this province has really looked at creatively using that oversupply in order to boost the secondary manufacturing sector and to develop jobs. We have talked glibly of fuel substitution, and that's about all. So I think there's a job to be done there.

The last point I want to make is that at the very least this committee has a responsibility to make some kind of a statement about the Darlington contracts as a result of the electrical growth projections that have been pulled together for us today. In fact, there isn't a heck of a lot new before us today that wasn't before us in February and March, except for the government's policy statements of the last couple of months. I think that in an interim report of some kind we should certainly make a

recommendation having to do with the moratorium on extension of contracts at Darlington.

Mr. Chairman: Julian Reed and Mickey have requested time for comments.

Mr. J. Reed: Mr. Chairman, I wonder if it's appropriate at this time to make a motion.

Mr. Chairman: It is always appropriate to make a motion, but I had thought earlier that we felt we wanted to have our discussion before we got to specifics. Hopefully, we can get back to this.

Mr. J. Reed: The reason I thought that maybe we have approached that time is that--

Mr. Chairman: Just a minute now. Are we discussing the procedure of the two reports, which is what I isolated in order to clear up, or are we getting into the substance of this?

Mr. J. Reed: The motion would deal with the preparation of two reports.

We are easy regarding whether it would be one report or two. We just feel that it would facilitate the work of the committee--

Mr. Chairman: Okay, let me have your motion.

Mr. J. Reed: All right. I would like to move that

the committee prepare a separate report on the matter of the growth rate, and that we proceed immediately, or forthwith if you like, with the consideration of the nuclear safety issue.

Mr. Chairman: Mickey.

Mr. Hennessy: I go along with that conception. I have to agree with my colleague from Thunder Bay that we have made so much noise and had so much discussion in regard to the safety of the workers, and the plant safety. If you mix both of them together, you are going to be confused. They are two lengthy reports. I honestly think that employment does enter into the situation, the economics of the province, and whether you should construct and spend all that money. Is it necessary to be totally in favour of having two different reports because we are confused enough at times with one report without having two?

Mr. Chairman: I think Julian's motion is really a reflection of what I detected as the consensus of the committee. Namely, there will be two reports, that we will get back as quickly as possible to the one on nuclear safety to tidy up the summer's hearings--

Ms. Gigantes: I have one question about that; Julian will be able to clear it up. If I understand the consensus--my understanding may be different from yours or from Julian's--we want a report on our safety work this summer. That will be quite a lengthy report with all the

poetry that staff can prescribe--

Mr. Chairman: Poetry, did you say?

Ms. Gigantes: All the poetry that staff can put in our mouths on it.

But on the second matter, the matter of the growth rate, the implications for extending contracts on Darlington, I don't consider that we have enough concrete new materials, aside from what the ministry has already said in the energy security from the 1980s, to be able to write a new report.

It seems to me if we want to make a recommendation, Julian, then make it just a simple recommendation, concerning how we believe the growth rate should be lower in terms of what Hydro is building on; two, that we feel that further contracts beyond the \$500 million that we assume to be the current level of contracts let, shouldn't be extended; and three, that there should be a government policy statement so that when we begin our work in January we can look at the background of the matter again in a way that we haven't really done.

Mr. J. Reed: May I respond? What I was trying to do is establish, first of all, whether we were going to try to put it all in one report or two reports, so the motion was simply--

Mr. Chairman: I was going to try to have a vote on the motion so we can have it cleared off, that we are going to have two reports and that the first one on the nuclear safety in the summer--

Mr. J. Reed: Two reports this fall, and I think the motion is fairly clear. It says the committee prepare--maybe I should say proceed forthwith or whatever--to prepare a separate report on the matter of the growth rate, and we will proceed immediately with the nuclear safety issue.

Mr. Chairman: Are we ready for a vote on that motion?

Mr. Ashe: Just clarification, because I frankly think this is maybe where some of the misunderstanding, as I acknowledged before, and maybe my misunderstanding of the last time came. What you are saying is we have two reports. That's very clear, and I agree with that. I don't agree with when the second report should be, as that's a different issue. But are you saying in it, and I think you are but let's make it abundantly clear, that the first priority for the staff--there will be two and you are saying two now and I acknowledge that--but the first priority to the staff will be to get the safety one finished and back in to us. Then it will be the second item.

Mr. Chairman: Are we ready for a vote on that motion?

Ms. Gigantes: Mr. Chairman, may I ask one more time, on the matter of the growth rate, are we actually

proposing in this motion that staff prepare the kind of substantial report that we will be preparing on the safety question?

Mr. Chairman: Evelyn, I thought we were going to proceed to an afternoon's discussion on that, and out of that discussion surely will come the answers to your question.

Ms. Gigantes: Well, I am quite happy to support the motion as long as it's understood that I don't think we are in a position to prepare a full-scale report. Mr. Chairman: Well, that will flow from our discussion this afternoon when we get back into the staff report of this morning.

Okay, are we ready for the motion?

All those in favour? Down. Unanimous.

Motion agreed to.

Now, may I suggest as we get back to the committee's work of this morning, that the real bottom line and the real point on which to zero in is their proposal that the growth rate, which we had fixed within a range of two to four per cent, upon up-to-date, more mature consideration can and should be in the range of two to three per cent. Everything else flows from that. As Mackenzie King would say, "Nikon!"

I would hope that the recommendations that are here. I would hope that the second report should be a simple, straightforward one and that we should be ready to proceed with it without further delay.

Ms. Gigantes: I hope I understand from what Mr. Nixon is proposing--that it would say explicitly that we don't think we should spend beyond the current let contract. Is that correct?

Mr. Chairman: I don't think he spoke to that. Mr. Nixon: We've talked repeatedly about the \$500 million of contracts let. The way that is put in the report I am really not prepared to say. I think we should simply say that our recommendation, not having to do with anything other than the need for electricity as we see it, should mean that the completion of the first segment of Darlington be postponed for six years.

Mr. Chairman: Once again we are getting into confusion by mixing two things. I thought I asked the committee if we could focus for the moment on the question of the growth rate--two to three per cent. If we have any further debate, argument or disagreement, let's decide that. What the ramifications of that may be on Darlington is the next issue but let's not mix the two. Have we any further debate on the question of accepting the proposal for a two to three per cent growth rate?

Ms. Gigantes: Yes. Mr. Chairman, when we considered this matter in January and February and discussed our consensus of two to four per cent, it seemed to me, as one member of the committee, to be stretching credibility to be talking about a consensus that ranged from two to four per cent. The implications, as we have seen by the kinds of information provided by staff both in February and now, are enormous in that two per cent range. I will express now, for the consideration of other committee members, the hope that we could also say to the government that we feel--and I think a lot of the discussion this morning indicates we do feel this way--that the decisions about what we should be doing should not simply be made on a projection of growth rate; we have done that, we have done it every year and we have been wrong every year. In fact, within one year now this committee is coming up with a different consensus, a smaller consensus--I wouldn't even call it consensus--on what the growth rate can be predicted to be.

I think it is time to say to the government, and I think we have enough information on which to base a statement like this, that in many areas we feel the growth rate is a question of government policy. I think we should be willing to consider at this stage putting that in a formal sense to the government, and saying that we

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[3:00]

Mr. Nixon: And he would jump. Ready; aye, ready. I personally think we should not embark on a lengthy series of rehearings about the growth rate. Even Evelyn would call it--which in my view is a report; that's what I would call it--based on the figures presented by the staff this morning, which were derived from figures arrived at in our hearings, I would be quite pleased, and I hope eventually there will be a motion to embody these in a report that does not have any poetry but simply the stark figures and the recommendation that we see.

It would be a waste of time for us to ask for Hydro to come in to comment further on these projections, other than that we haven't heard from them since last March. I think all we should do is put that in on the basis of the information, the most recent information that any committee I know has had access to. I don't think it is necessary to continue this matter with an elaborate series of rehearings and reconsiderations.

I believe the second report, so-called, having to do with growth rate, ought to embody almost in essentially the way it is here, the information that has come from our hearings, that has been winnowed by the staff both statistically and in other thoughtful ways, with the

recommend the government acknowledge at this stage that it is not just the price of gas, and it is not just the supply of oil and all these unknowns that we try to put into these columns for our different scenarios, it is also public policy on these questions.

We should also say we feel there is a question of the government's public policy to be settled about what the government's goal is in the matter of providing for adequate energy supplies for Ontario; that in fact the government has a choice of how those energy needs shall be met; that we are no longer satisfied as a committee to sit and say, "Well," this scenario might work, or "That scenario might work," but also that there is a public policy question involved about the growth rates we not only expect to see but want to see.

**Mr. J. Reed:** Mr. Chairman, I can appreciate Evelyn's sentiments in this regard. But I would impress on the committee that we have a mandate regarding Ontario Hydro affairs. What policy the government sets regarding the growth of industry, which directly reflects in the growth of the consumption of electric power; what policy the government sets in the spending of money; what policy it sets in all of those areas which reflect on that growth is the prerogative of the government.

If we want to talk about government policy in these regards, with respect, I feel it should not be in the Hydro select committee; it is the purview of all sorts of other avenues to discuss policy. Policy can be discussed in estimates; it can be discussed on other standing committees; I really feel our mandate here certainly should reflect our findings regarding the growth, and we have a responsibility to make a comment on that.

The other things that will influence that are a matter for the government to decide. We can debate interfuel substitution for hours here. I could talk to you about the advent of the electric automobile.

**Mr. Chairman:** I believe you.

**Mr. J. Reed:** My friend George Ashe could tell you it is going to have an upward impact on the consumption of electric power. I could take another equally logical view and say it will only have impact on the using up of the off-peak hours of electricity.

We could get into all sorts of these debates, but I really don't think it is within our mandate to dictate or make recommendations on policy outside of the purview of Ontario Hydro and Hydro's operations.

**Mr. Chairman:** Okay. Have we agreement on the

Ms. Gigantes: I think it should be lower, but I'll accept two to three per cent if we can go on and discuss something more substantive.

**Mr. Chairman:** That is what I'm hoping. If we can get agreement on this, we can then take our next step.

Ms. Gigantes: You won't mind if I put in a little footnote to say I think it should be one per cent.

**Mr. Ashe:** Mr. Chairman, as we get to that, I am sure there will be many minority views. I would have to think, based on the information the committee has before it, that that's probably a correct figure. I am not quite sure that cutting it down to two to three from two to four, as it was before, actually is very wise; I don't think it is leaving enough leeway for some of these other question marks that people acknowledge are there--again acknowledging that you could argue it both ways; I am not disputing that.

**Mr. Chairman:** When you figure that up to the end of September of this year--and you wouldn't say it was the most booming economy in 1979; we know of a lot of other industrial thrusts that have been committed and that haven't come on stream yet--the growth rate to the end of September is 2.9 per cent--

**Mr. Chairman:** It's 2.9 for the whole year and 2.7 to the end of September--1.9 for the first six months, 2.7 for the first nine months.

**Mr. Ashe:** Okay, one of us is wrong. Anyway, it's only 0.2 per cent.

**Mr. Chairman:** I'm willing to bet on which one. Mr. Ashe: Maybe I have a typographical error. In any event, it is closer to the three than it is to the two--2.7 or 2.9 is closer to three than it is to two. I really feel a little reluctant to reduce the figure to two to three per cent, although there is no doubt two to four per cent is a substantial range. I can't argue that either because it's true. But I think we do have enough question marks on many of these issues about the economy, fuel substitution and this kind of thing that the two to four per cent rate is still reasonable.

I also agree, based on what the committee now has before it--and it has already decided it doesn't want to get into these other things at this time--the two to three is probably reasonable.

**Mr. Chairman:** We have a fairly solid consensus on the two to three. Can we now move to the implications of that, I presume really in relation to Darlington and nothing else.

**Mr. Nixon:** Although it does not form a part of the written submission, it formed a part of the evidence, that there any further debate, any disagreement on that?

on the basis of the required megawatts on a growing load,

plus a suitable 25 per cent reserve margin, the requirement for the first generator from Darlington, would be five to six years later than is presently planned.

I just want to check that with Jim, because when we were talking about it this morning, the five to six year delay was based on the final generator. I asked: "Would this be the same for the first one?" He indicated there might be some variable of which I wouldn't be aware but he might be.

Mr. Chairman: What is the existing schedule and what is the new schedule in the light of your report?

Is it 1986 to 1990 or is it 1990 to 1996, or what?

Mr. Fisher: The existing schedule is 1987, 1988, 1989, 1990 for the four units.

Mr. Ashe: I think it is 1988 to 1990.

Mr. Fisher: Do you think 1988 is the first one?

Mr. Ashe: Yes.

Mr. Nixon: 1988 to 1990? Do you mean it has boiled down to two years for the four units?

Mr. Ashe: 1988, 1989, 1990--three years for the four units. The one in early 1987 went into 1988.

Mr. Nixon: Here is something we really have to check with the people who have done the arithmetic on this and made a projection. It seems to me there is a reasonable expectation of postponement on present policy, if we are going to look at the growth rate. Is it fair to say a five-year postponement over the present schedule?

Mr. Fisher: I think it is fair to say a five-year postponement for the last unit, and probably the last two. I am not sure if you could say a five-year postponement for the first one.

Mr. Nixon: It is funny, because it is the first unit that is significant as far as public policy. It is more significant, it seems to me, than the last.

Mr. Fisher: I am still not sure whether it wouldn't work out to be a four-year postponement for the first one and a five-year postponement for the last one. You try to match it to the load.

Mr. Chairman: What you have now got from the original schedule was that the first one was going to come on in 1984. It is now 1988. It is already postponed four years. What I should like to get clear in my mind is, in the revised schedule that flows from what the staff presented, what is it--1992 to 1996?

Mr. Schwartz: It is about that. What Jim is saying is we can't tell you at this point where the first year would be because you would have to do some--

Mr. Nixon: But the completion of it would be postponed, according to the data we have been examining, by six full years.

Mr. Fisher: Six full years, of course, and that is based on your three per cent. That is the upper end of the range. That's not the lower end.

Interjection.

Mr. Nixon: What is the matter? Do you feel this is a waste of time? Do you not want us to discuss this?

Mr. Chairman: I think we should get these parameters clear.

Ms. Gigantes: Can I ask Bob, would it make more sense, instead of talking about trying to concretize which unit we are delaying or recommending a delay in, and for how long and all that kind of thing, if we said this is the schedule as it is established, and this is the growth rate we are accepting and the government recommends? I think, Mr. Chairman, it is very important to sort out to whom we are making the recommendations.

I think we have to bear in mind to whom we are making recommendations. We are not here to recommend to Hydro. We report to the Legislature of Ontario and to the government. The government will then make its own government. The government will then make its own decisions on our recommendations, as in the past.

If we want to make a recommendation to the government, perhaps the clearest way of putting it is, until we understand more from the government, and also quite probably from our own review of the government's position; and whatever additional information we need for such a review of why Darlington should continue on the current schedule, we recommend the government say there be a moratorium on increasing the contracts that are left for equipment for Darlington.

[3:15]

In other words, for the next several months until this matter is much better defined than it is now, we live with the current level of let contracts so we don't get ourselves into the same position we were in over the Bruce heavy water plant where, as the considerations went on, the money kept getting spent, and by the end of two and a half months, so much money had been spent it became a question of whether we could actually save anything by stopping it, because there had to be payments for breaking contracts.

To put those things out in a recommendation seems clearer than to talk about a four or six year delay, or that kind of thing.

Obviously we are going to have enough time to reconsider. We will have a better sense of how long the delay involved might be in the next few months, given the government requirement to answer the questions that have been raised and our interest in following through on some of those questions.

Mr. Nixon: I wasn't quite finished. I just want to say the essential piece of information we want to convey is the growth rate. All of the ramifications that come from that and all the decisions are taken by other people. It so happens the Darlington decision is the most immediate one and it concerns us. If the government decides, or Hydro decides, it must proceed on its present timetable in spite of the fact this review indicates the growth rate is reduced, I suppose we can be critical of them.

I don't know whether we are really in a position--we could certainly say the implication of this could be a postponement of six years in the presently understood completion timetable for Darlington. If we want to add to that for that reason we advise Ontario Hydro and the government through the Legislature that no additional contracts be entered into without a statement of government policy, that would be fine.

Mr. Hennessy: Mr. Chairman, there is some talk about postponement for six years. This morning there was some talk by some of the members about provincial economic priority.

If you were to close Darlington, how many jobs would you cost the area? Would it be 5,000 people off work in this area? When you look at the economic situation the way it is today, if you postpone it for six years, the costs are going to multiply beyond reason in six years' time if the present trend keeps on.

Mr. Nixon: Five billion dollars we could spend in a much more effective way, if you want to make jobs. Mr. Hennessy: All I am saying, and I think it is fair, is you can't ride both horses. We have a group of people marching in front of Queen's Park saying they want jobs, trying to blame the government. We should also look at the economic responsibility we have. You have to realize how many people are going to be unemployed if you decide to close these plants.

You have to look at the human side as well as the dollars and cents side. If you postpone anything, it is going to cost a lot more money later on.

If we are looking to provide employment for people, there are all kinds of programs instituted by the government. Sometimes they don't get off the ground; sometimes they do, but they all cost money. We understand that.

If you have 5,000 people not working, you are going to have 5,000 more people on social services. The government is going to pay for it one way or the other. We should look very, very carefully in which direction we go with regard to how many people will be unemployed, without jobs, without anything on the table.

Mr. Nixon: I just want to make a decision one way but, on the other hand, you are hurting maybe 5,000 people. With families, it's about 15,000 to 20,000 people, if you want to take families.

Mr. Haggerty: I wasn't going to get involved in too much depth, but I am concerned about the two to three per cent growth factor. I suppose it does relate to our concerns as to whether Darlington should proceed to completion or not. The estimated cost of a nuclear plant is about \$5 billion to \$7 billion, and if we look at the interest rates today the price could be \$10 billion if we had to go to a foreign market to borrow it.

Bob Nixon mentioned delaying Darlington, and I think the committee can be safe in saying we don't need it, because there are other alternatives in our electric generation programs in Ontario, specifically renewable resources. I suggest that if we got into the area of looking at 17 other sites this could create jobs too, but it would be less costly than building the Darlington plant.

I just received a hydro bill in the past week indicating that I was going to be paying a 10.6 per cent increase as a rural customer. It's higher than in the city for urban customers. If we continue building the generating plants that Hydro has on its program to date and it has to go out and borrow money at the high interest rates of today and the high exchange on the Canadian dollar, it isn't feasible.

I don't approve of building these plants and saying to the present customers, "You pay for that now, for something that's going to be coming on stream in the year 2000." It's not right. I don't think anybody should be paying for somebody who is going to make use of something in the year 2000.

Mr. Ashe: That's not the way it works. They hold back the rates until it goes on stream. Mr. Haggerty: Somebody has got to be paying for this high interest.

Mr. Chairman: When it's built and mothballed it's in the rates.

Mr. Ashe: But that's not what he's talking about. Mr. Haggerty: If you're building this site at Darlington the money has got to come from somewhere. Those bills have got to be paid, so we're paying for it now. I don't think we should be moving in that direction, that we should be building everything now for the year 2000. This committee has been successful in bringing down the Hydro rates to customers in the province of Ontario.

I remember three or four years ago they wanted

almost 30 per cent. We whittled it down to about 16 per cent and then it gradually came down to about 12 per

cent. Then the Anti-Inflation Board guidelines came in, which limited the increase to about eight per cent. Those AIB guidelines have disappeared now, and that's why we're paying 10 per cent or 16 per cent increases. Next year it will probably be higher than that.

Mr. Ashe: It's averaged 9.3 per cent, if I remember, in the last four years.

Mr. Haggerty: Yes, that's the average, but let me tell you that my bill is going up 10.6 per cent. It will cost me less than that now, since we're into restructuring in the Niagara Peninsula.

Mr. Ashe: Sure, you'll get a bonus because of the restructuring.

Mr. Haggerty: Yes, that's right, but I'm buying my power from Canadian Niagara, which is an American-owned company that gets it from the Canadian side for almost nothing. It's a sweet deal for them. But I bring this to your attention, I wouldn't be afraid to make a decision here saying that we stick to the three per cent growth rate for Hydro and cut Darlington right back and, if we have to, we can look at these other 17 hydraulic plants and that will create jobs.

But, as Bob Nixon said, that will cost \$5 billion to \$7 billion and there is a shortfall of capital here in this government of Ontario. That could go a long way to create employment in Ontario in secondary industries. In the past, Hydro has taken everything to finance its programs in the province, with a shortfall to the rest of the province of Ontario. That cost is reflected in property taxes in the local municipalities, because there hasn't been the transitional grants going in sufficient amounts to these municipalities. I suggest that's the way we should go.

Mr. Ashe: It hasn't got a damned thing to do with that at all.

Mr. Haggerty: You want to believe it has.

Mr. Conway: Such language.

Mr. Chairman: Bob Mackenzie, please.

Mr. Haggerty: Go back and see what Mr. McKeough would have said in the past few years on that. He would have told you.

Mr. Mackenzie: Mr. Chairman, I may be missing something in the remarks that Bob Nixon was making when he was talking about a delay of four to six years, or whatever it is, in completion of a unit. What I'm not clear on in that, and the reason I lean more to Evelyn's comments, is that I don't think it makes any sense at all to call for a four to six-year delay on completing Darlington if, in the meantime, we're going to go on spending the money as we're doing now on whatever amount of money is let out in contracts.

It seems to me that the answer has got to be to say that until we show the need, or a little further down the road in terms of necessity, or until there is some kind of a government statement that tells us why the hell they want it, they're going to have to stand on--and not based on the growth because they can't, at the moment, justify it on growth--we've got to say there will be no more contracts issued on that deal.

I think we're better off not to put a time on it because if somebody can give me a good economic reason two, three or four years down the road that's another argument. I think that's what we've got to look at, unless it's implied in the five- to six-year delay, it doesn't make any sense unless we make sure we cut off the further expenditures at this point in time.

Mr. Ashe: I'm sure--

Mr. Mackenzie: I'm not sure. Maybe there should not be a time limit.

Mr. Chairman: Mr. Reed has the floor.

Mr. J. Reed: I just want to make the point that how the government spends its money is the government's business and it's for us to criticize. That's the way the government in power operates. It's not for us to tell them how to spend their money.

Mr. Foulds: It's never stopped you before.

Mr. J. Reed: We can tell the government how to spend its money as critics, and we do that--

Mr. Foulds: Is this a new theory in government procedure?

Mr. J. Reed: --I hope we do it, and fulfil a responsibility in doing so. But on this committee, we are not going to launch into some industrial alternative, or whatever. There's a place to do that.

Yes, I could talk about priorities too. I'll tell you, at this point in time if I had \$5 billion, which it presumably is going to cost to build Darlington, to transfer, in terms of our energy priorities I know exactly where I'd put that \$5 billion and it wouldn't be into an electrical generating plant.

Mr. Ashe: What are you going to do with all those big windmills?

Mr. Chairman: Order, please.

Mr. J. Reed: I can tell you that I would be putting it into an area where it would produce an awful lot more jobs than the construction and operation of Darlington. But that, of course, is a prerogative that I would exercise were I the Minister of Energy.

Mr. Nixon: This time next year.

Mr. Ashe: Don't bet on it.

Mr. J. Reed: So we hope the people of Ontario may be in a better position to benefit in a year's time from the \$5 billion than they may be just now. We could debate that all night, I think. We have lots of ideas where we would put \$5 billion of capital rather than into generating facilities at the present time. But I just don't think it's the prerogative of the committee.

Mr. Chairman: I have an idea where it should be put. After Evelyn has spoken I think I'll throw it in.

Mr. Ashe: Are you going to throw \$5 billion in the pot too?

Mr. Chairman: Right.

Mr. Ashe: Good.

Mr. Chairman: Evelyn has the floor.

Ms. Gainte: Do you sense a consensus coming that I don't? Or do we have a motion?

Mr. J. Reed: I sense a consensus.

Mr. Chairman: What were you going to say?

Ms. Gainte: If you can feel a consensus coming, that's fine with me, depending on what you feel is coming.

Mr. Schwartz: So it may or may not be fine with you.

Ms. Gainte: I don't like to barge in with motions and disrupt the smooth flow of processing. Mr. Chairman: There is some argument as to whether we should spend our time trying to define what is the new schedule. I thought it was rather useful and tidy. But if the present schedule is 1988-90 to complete four, and the new schedule is going to be roughly 1992-96, you won't need the final until '96, so presumably if you're doing one a year you would start in '92. That's rather tidy.

Mr. Nixon: You have a consensus now, though, and that is what we think the growth rate is, but that can make a nice one paragraph report.

Mr. Chairman: Okay, but we've agreed on that. Let's not go back on that. What flows from it is that we don't need Darlington. I'll throw in my idea of how you spend your \$5 billion.

The world has been dazzled, and we in Ontario have been dazzled by the size of the heritage fund in Alberta--\$5 billion. What we're proposing to spend on Darlington is the equivalent of the whole heritage fund in Alberta at the present time.

Mr. Ashe: Today, yes.

implemented is the program of \$14 billion in bringing non-conventional fuel sources into play. He is hoping the private sector will pick it up. On the basis of past experience, there is no evidence the private sector will pick it up in order to meet a minimum goal of five per cent input from the non-conventional resources. Therefore the \$5 billion in there will produce as many jobs as it would in Darlington.

Mr. J. Reed: More jobs.

Mr. Ashe: There again, Mr. Chairman, is where people can't have both sides of the argument. People are saying how viable some of these alternatives are and how practical they are from an economic sense. That is why the obvious conclusion, then, is that private entrepreneurs and private capital are going to do the job. If you are going to argue against that scenario, you have to back off on the fact that it is so damned practical.

Mr. J. Reed: Perhaps, George, you would acknowledge that just last year the Federal government and the provincial government each did separate studies on a fuel alcohol alternative using renewable feedstock. The provincial government came to the conclusion that it was not a viable consideration for Ontario. The federal government came to the conclusion that it was, and that it could make a profound contribution to Canada's fuel requirement in the future.

Mr. Ashe: They were looking at different figures than we were.

Mr. J. Reed: No. There is a federal report out, and there is a provincial report out, and they both came to opposing conclusions.

I don't want to belabour this, but the point is that conditions have changed over the last six months once again--

Mr. Ashe: And will continue to change.

Mr. J. Reed: --and I agree with the chairman 100 per cent that there is a time, if we are going to try to accomplish in energy in a few years what evolution took maybe a generation to accomplish, when government does have to play a role in at least creating the climate so that private enterprise can flourish.

Mr. Ashe: That's what we intended to do. I'm glad you have finally acknowledged our program.

Mr. Chairman: My list now is Alan Schwartz, who has got a consensus--so just hold, he has got it--and then after that are Jim Foulds and Bob Nixon.

Mr. Schwartz: Through the discussion this afternoon hasn't the committee agreed that electrical energy growth will be between two and three per cent? That is the first thing.

The second thing is that that will have an implication on Darlington. The implication is that there should be a further delay. The delay need not be specified. You can say a delay until the demand is such that it is required, and that will depend on how the load grows. Until such time as one knows exactly what steps we will take with Darlington, whether it will be delayed for three years or five years, or whether the government wants to proceed with building it immediately for some other reasons, there should be no further expenditures until there is an explanation of what is occurring, what steps the government is taking and what it is based upon.

Mr. Chairman: Commitments.

Mr. Schwarz: Commitments, exactly.

Mr. Nixon: Let's do that.

Mr. Schwarz: Everybody seems to be saying "okay." If that is the consensus after writing the nuclear report, which is our number one priority, can we come back and write something that reflects that?

Mr. Chairman: My list now is Jim Foulds and Bob Nixon.

Mr. Foulds: The only addition I would make to that is to follow up on your suggestion, Mr. Chairman. If the government decides, in its wisdom, to cancel Darlington--

Mr. Chairman: Delay, delay.

Mr. Foulds: --we recommend that it put \$5 billion into an Ontario heritage energy fund.

Mr. Nixon: I don't really have to say anything other than to point out to the chairman and the last speaker that while those are all greatly to be desired, we are not a renewable resource committee, we are a hydro committee, and I think we would not be doing anybody much of a service if we muddied up our recommendations with anything other than this one.

We can make speeches till the cows come home about fuel, methanol, solar and the rest, and how the Minister of Energy should implement the bare bones of his recommendation, but I just--

Mr. Chairman: Bob, if you go back to one of the

areas which will require additional hearings and time. If he prepares it as he described it, and I am sure he will and can, I am in favour of that and will vote for it.

Mr. Chairman: Has anyone any further comments on additions or subtractions from the suggested nature of the report presented to you by Alan?

Mr. Ashe: I am not sure that I will ultimately support the report, but the nature of the thrust, that's fine.

Mr. Chairman: Fine. Mr. Williams: There are two separate ones.

Mr. Chairman: Right. We agreed on that in your absence.

Agreed?

Some hon. members: Agreed. Mr. Chairman: Is there any further business to be dealt with?

Mr. Foulds: I made a motion about the Ontario energy Heritage fund and I am not withdrawing it.

Mr. Chairman: I didn't know you made a motion.

Mr. Foulds: Yes.

Mr. Nixon: I didn't hear him make a motion.

Mr. Foulds: Yes, he did.

Mr. Nixon: I didn't hear him make a motion.

Mr. Foulds: I didn't hear him make a motion.

Mr. Nixon: Let's have the record read back--

Mr. Foulds: I certainly did.

Mr. Nixon: --after it is printed. Mr. Chairman: If he hasn't made it, he has the right to make it now. The meeting hasn't been closed. He wants to add to the scenario, namely, that there should be some emphasis on the non-conventional renewables with any money that might be available from a postponed Darlington.

Mr. Nixon: We have \$5 billion just sitting there waiting to be spent.

Mr. J. Reed: I would love to speak to that motion. Mr. Chairman: I have to ask the mover of the motion what wellspring of wealth is the source of funding for this heritage foundation.

Mr. Foulds: Wherever they're going to get the money for Darlington.

Mr. J. Reed: It seems to me that the \$5 billion which is more or less earmarked to go into Darlington would come from two sources--hydro rates, rate increases, and borrowing on the New York market, which inevitably results in hydro increases anyway. But I would ask the mover of the motion, does he expect our fund should be built out of increasing hydro rates to consumers?

Mr. Conway: Might I respectfully suggest, in light of my colleague's recent comments and the mover's

intentions, that perhaps the motion might be tabled for further consideration so that we can more fully appreciate what the mover's intentions are and how he might propose to deal with some of the very legitimate concerns raised by my colleague?

Mr. Chairman: There is a motion that the motion should be tabled.

Mr. Nixon: Is that debatable?

Mr. Chairman: It isn't debatable.

Mr. Nixon: Let's put it.

Mr. Chairman: All those in favour of tabling the motion.

Opposed?

The motion is tabled.

Any further business?

We shall meet at the call of the chair. Incidentally, let me warn you--and we are going to have further meetings--that we may not be able to fit them in on Wednesday.

Mr. Schwartz: Is there any preferred night if it is going to be night-time meetings?

Mr. Ashe: Sunday, anytime after nine o'clock.

Mr. Conway: Saturday in Pembroke.

Mr. Schwartz: Okay, Saturday or Sunday evening seems to be preferred.

Mr. Chairman: I think this meeting has really disintegrated. The committee adjourned at 3:40 p.m.



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APPENDIX E

SLIDES USED IN  
STAFF SUMMARY OF THE  
EVIDENCE

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E/1

THE NEED FOR ELECTRICAL CAPACITY

Review and update of material presented to Committee

January To March 1979

SELECT COMMITTEE ON ONTARIO HYDRO AFFAIRS

OCTOBER 24, 1979

THE PURPOSE OF THIS PRESENTATION IS TO REVIEW AND UPDATE THE MATERIAL PRESENTED EARLIER THIS YEAR.

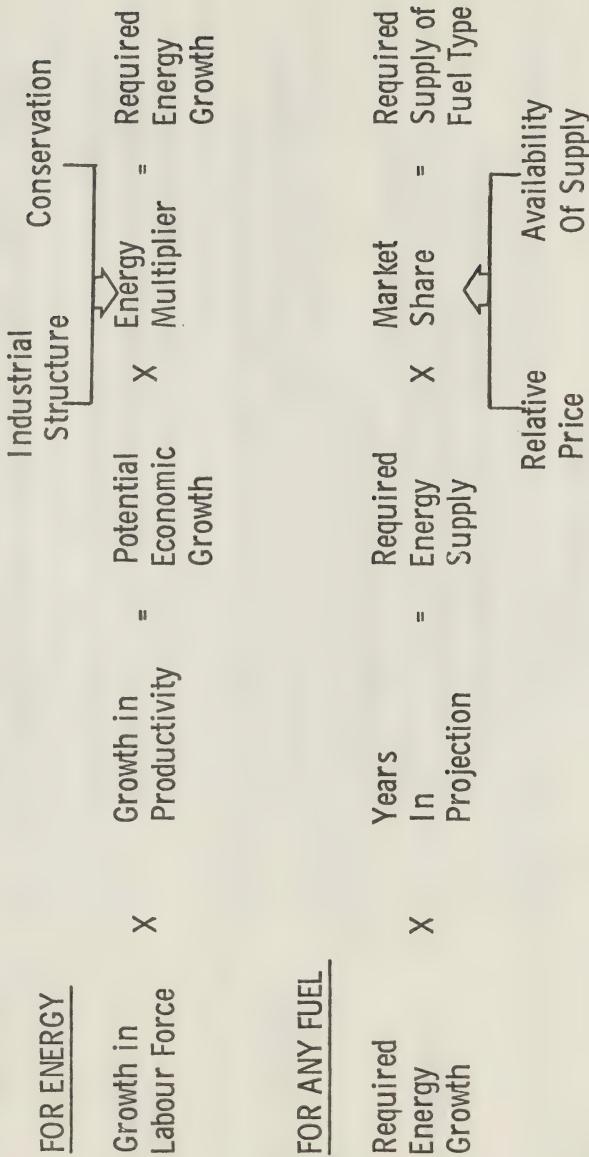
WE WILL DO THIS BY:

1. Reviewing the essential elements in energy planning
2. Showing how these elements are expected to combine to produce lower energy growth in the future
3. Reviewing the various projections presented to the Committee
4. Commenting on the likely impact of recent information on the demand for electricity

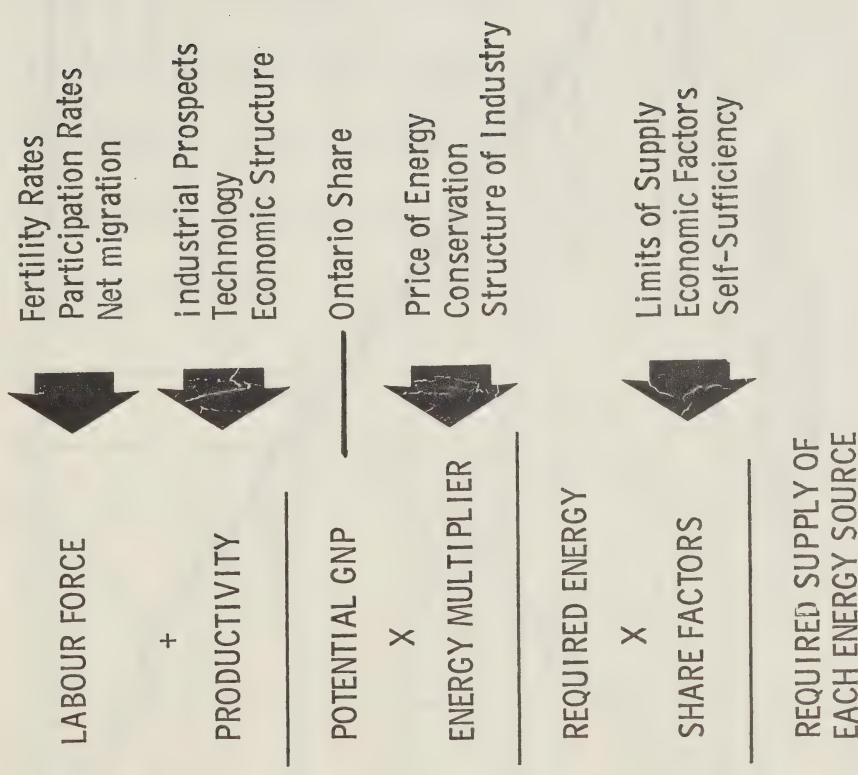
EARLIER IN THE YEAR WE HEARD VARIOUS FORECASTS OF THE FIVE ELEMENTS THAT ARE CRITICAL IN ENERGY PLANNING

TOPIC	CONSENSUS VIEW
DEMOGRAPHICS	<ul style="list-style-type: none"><li>Population growth definitely slowing because of decreasing birth rate and immigration</li><li>Labour force growth uncertain because of highly speculative participation rates</li></ul>
ECONOMIC GROWTH	<ul style="list-style-type: none"><li>Expected to slow in line with new population projections</li><li>Expected to continue to produce real income growth</li></ul>
INDUSTRIAL STRUCTURE	<ul style="list-style-type: none"><li>Likely changes in response to limited growth potential of resource industries and manufacturing competition</li><li>Likely growth in high technology and service industries</li></ul>
ENERGY SUPPLY	<ul style="list-style-type: none"><li>Gas supply prospects continually improving; oil supply prospects still dependent upon tar sands exploitation</li><li>Renewable technology prospects continuing to improve</li></ul>
CONSERVATION	<ul style="list-style-type: none"><li>Price responses have been far greater than anticipated</li><li>Technological responses for improving efficiency of energy use are appearing at an accelerated rate</li></ul>

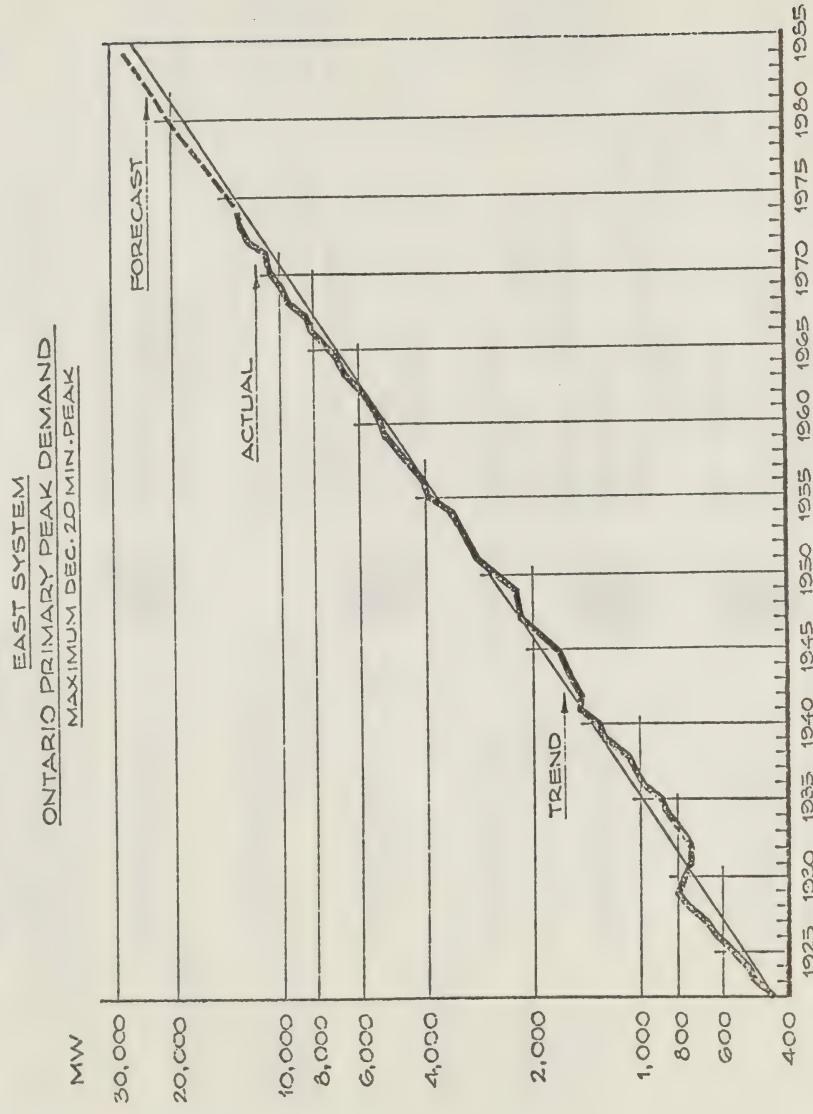
THE ESSENTIAL ELEMENTS OF ENERGY PLANNING CAN BE REDUCED TO A  
SIMPLE SET OF RELATIONSHIPS



THE SIMPLICITY OF THE RELATIONSHIP SHOULD NOT OBSCURE THE UNCERTAINTIES IN FORECASTING EACH VARIABLE . . .



A FEW YEARS AGO ELECTRIC ENERGY GROWTH WAS EXPECTED TO CONTINUE AT  
ABOUT THE SAME RATE

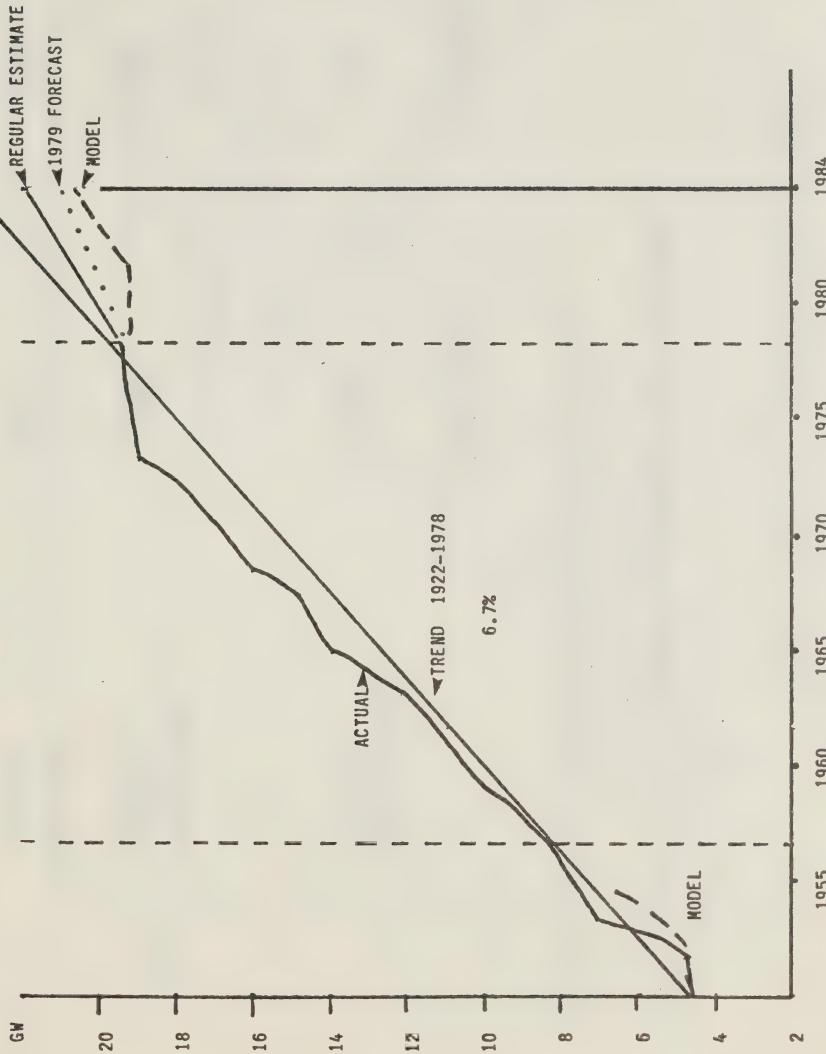


- 1922-29 - INCLUDE THE DOMINION POWER TRANSMISSION CO. BOUGHT IN 1930.
- 1933-45 - INCLUDE CONVERSION OF AMERICAN CYANAMID SECONDARY TO PRIMARY, WAR AND FIRM EXPORT EXCLUDED.
- 1947-48, 49, AND 51 - INCLUDE ESTIMATED EFFECT OF RESTRICTIONS.
- SOURCE - BASED ON ONTARIO HYDRO -OLD AND CAPACITY REPORT 75061G.

NOW, EVEN HYDRO IS ANTICIPATING A SLOWDOWN IN THE GROWTH RATE

EAST SYSTEM - DECEMBER PEAK

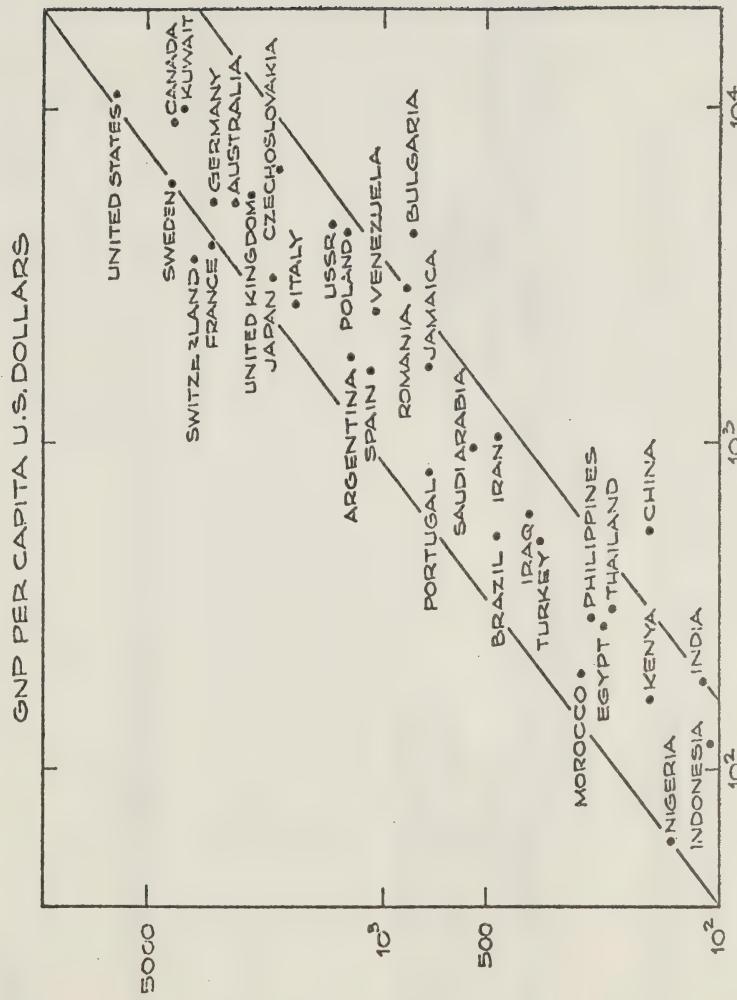
E/7



THE REASON IS THAT SEVERAL VARIABLES HAVE CHANGED . . .  
FOR EXAMPLE TYPICAL ANNUAL GROWTH RATES OF:

	<u>POST-WAR</u>	<u>FORECAST</u>
Labour Force Growth	2.25%	1.5%
	+	+
Productivity Growth	<u>2.25%</u>	<u>2.0%</u>
Real GNP Growth	4½%	3½%

ENERGY GROWTH WAS THOUGHT TO GROW AT ABOUT THE SAME RATE AS GNP



SOURCE - UNITED NATIONS ENVIRONMENT PROGRAM

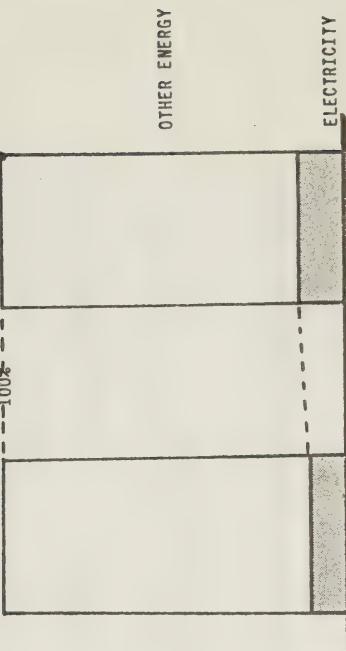
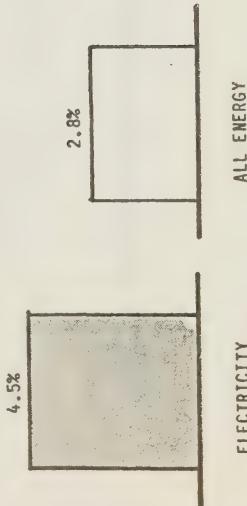
••• WITH ELECTRICITY GROWING  
EVEN FASTER

THE PER CAPITA CONSUMPTION OF  
ELECTRICITY IN ONTARIO HAS  
GROWN ALMOST TWICE AS FAST AS  
OVERALL ENERGY CONSUMPTION . . .

••• INCREASING ELECTRICITY'S SHARE  
OF TOTAL ENERGY CONSUMPTION FROM  
11% TO OVER 14%

E/10

AVERAGE ANNUAL GROWTH RATE 1958-1973



1958

1973

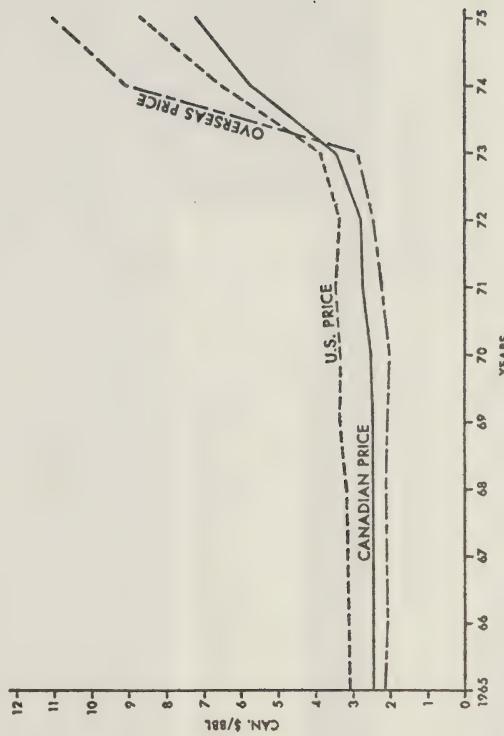
1958

Source: Ontario Hydro Exhibit B-8

# THE ABUNDANCE OF SUPPLY WAS REFLECTED IN YEARS OF CONSTANT PRICES

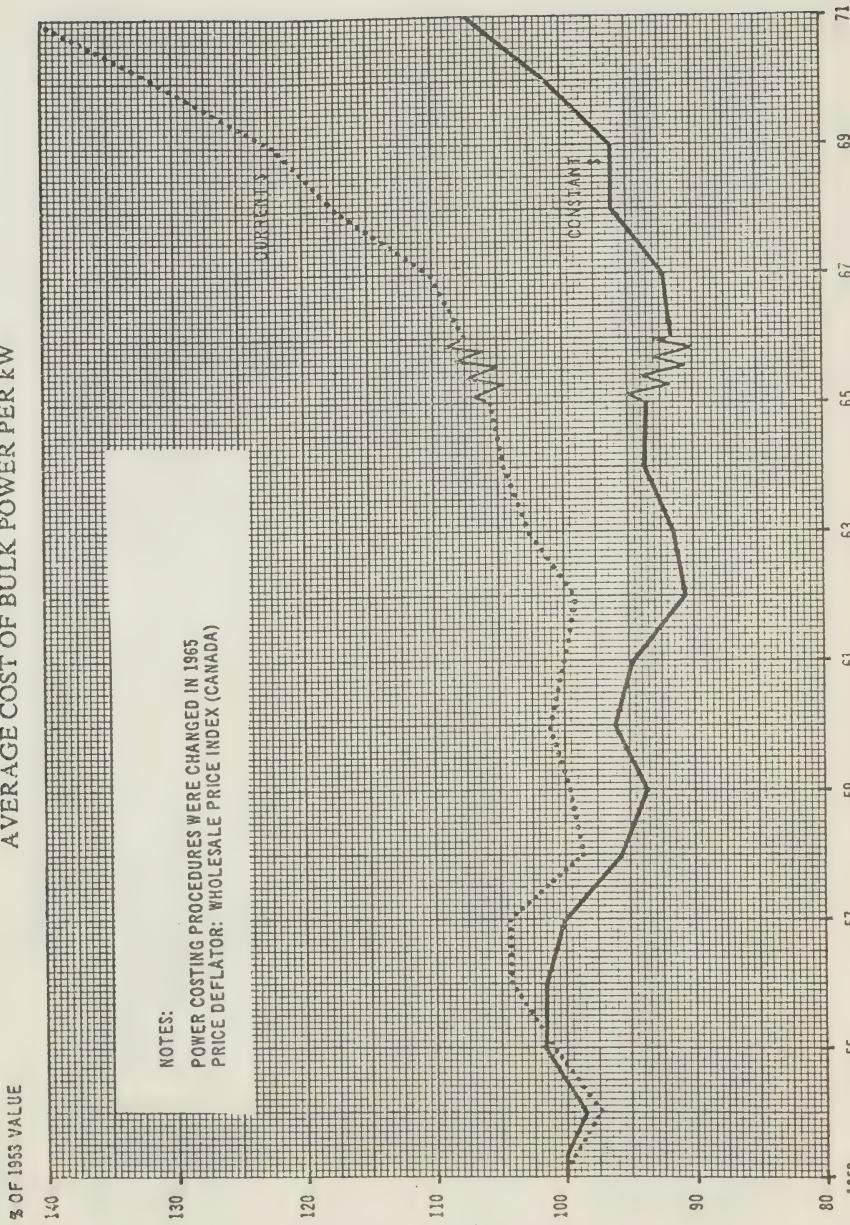
• • • FOR OIL

Price at source of Canadian, United States and overseas crude oils, 1965-1975



## • • • AND ELECTRICITY

### AVERAGE COST OF BULK POWER PER kW



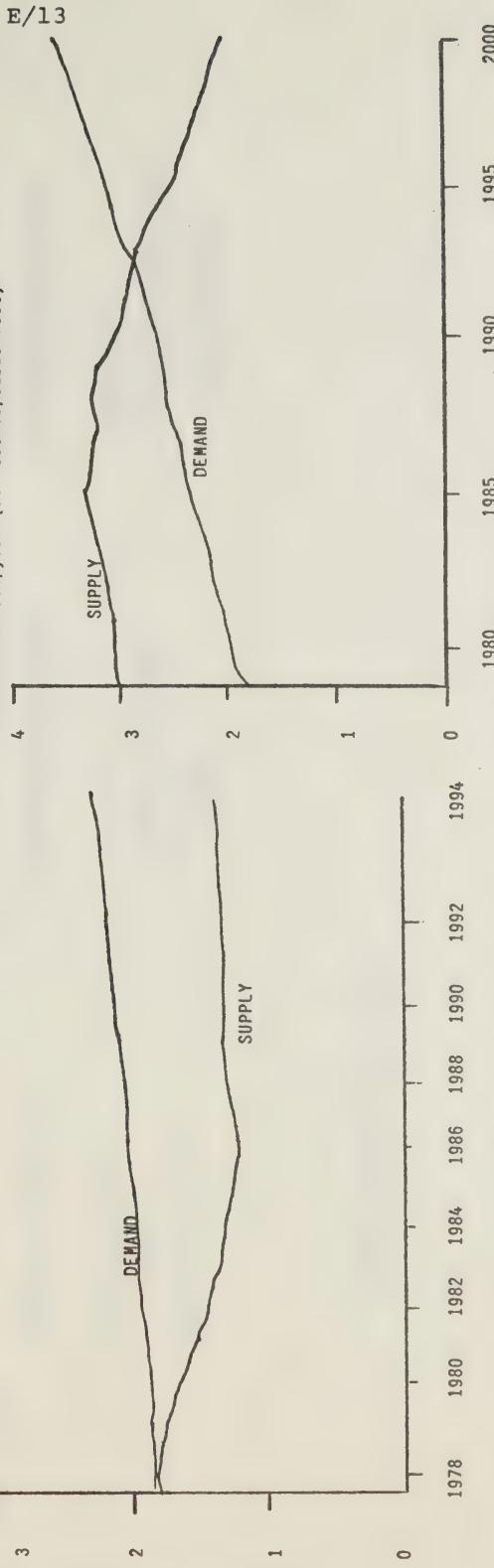
# NOW, THERE ARE DOUBTS ABOUT LONG TERM SUPPLY OF CONVENTIONAL FUELS

## ONTARIO ENERGY REVIEW

Canadian oil supply and demand outlook

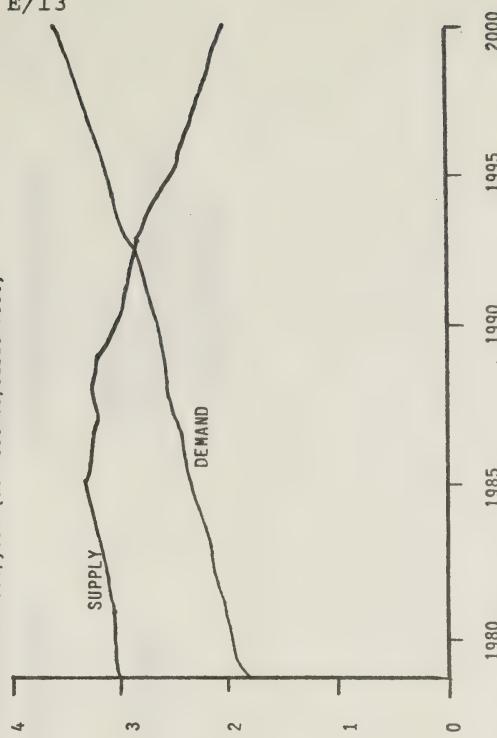
Medium Projection

Million Barrels/day



Canadian natural gas supply/demand outlook

Trillion cubic feet/year (at 1000BTU/cubic foot)



E/13

... AND PRICES WILL RISE.

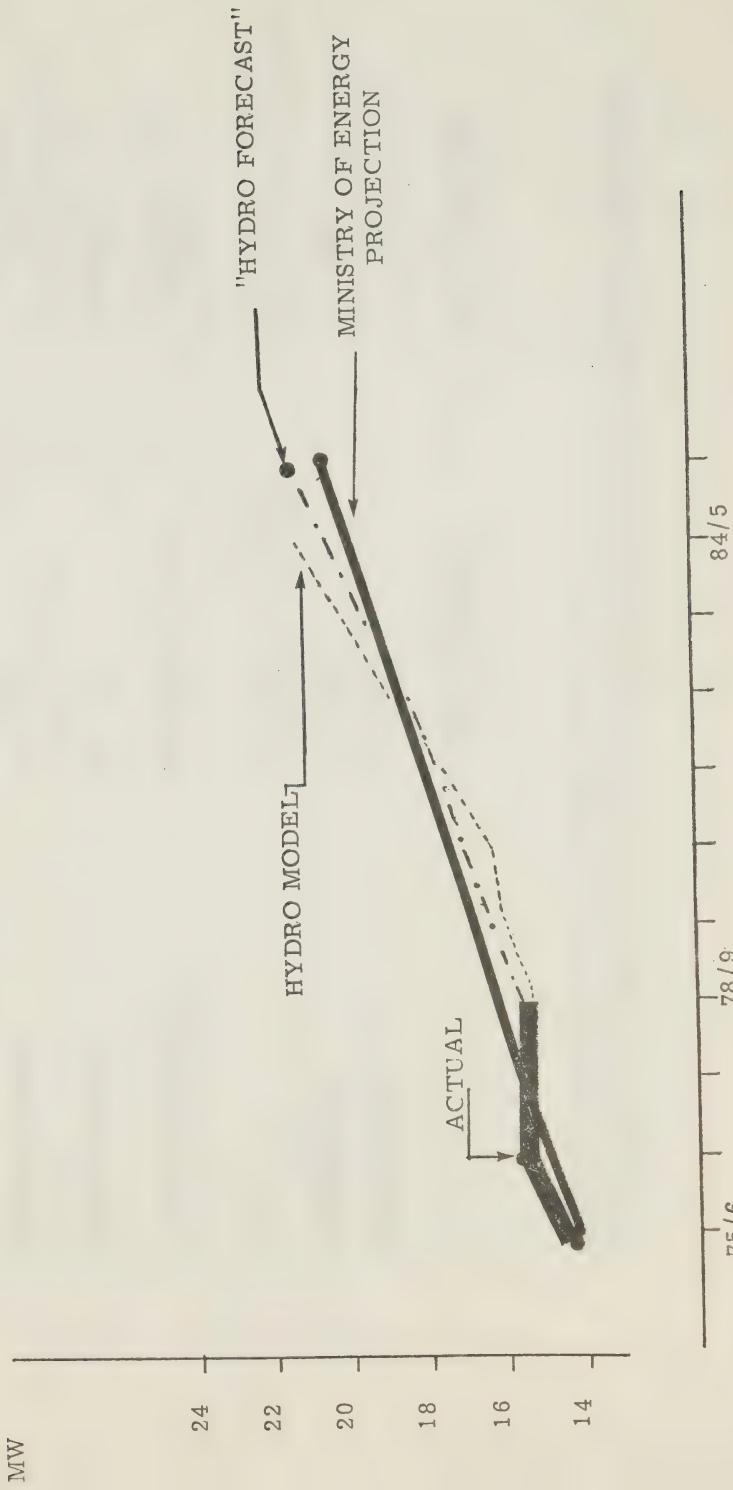
<u>POSSIBILITY</u>	
<u>NOW</u>	
OIL	Crude \$13.50/bbl
	\$24.00/bbl at current world level
GAS	Home Fuel 67¢/gal
	\$1.20 at world level equivalent
ELECTRICITY	Residential \$3.30/mcf
	\$4.50 at 65% on BTU basis
	3½¢/kwh in 1980 and rising at about 10% per year

ALL OF THESE FACTORS HAVE LED TO A NEW RELATIONSHIP BETWEEN GNP AND ENERGY GROWTH EXPRESSED IN THE "ENERGY MULTIPLIER".

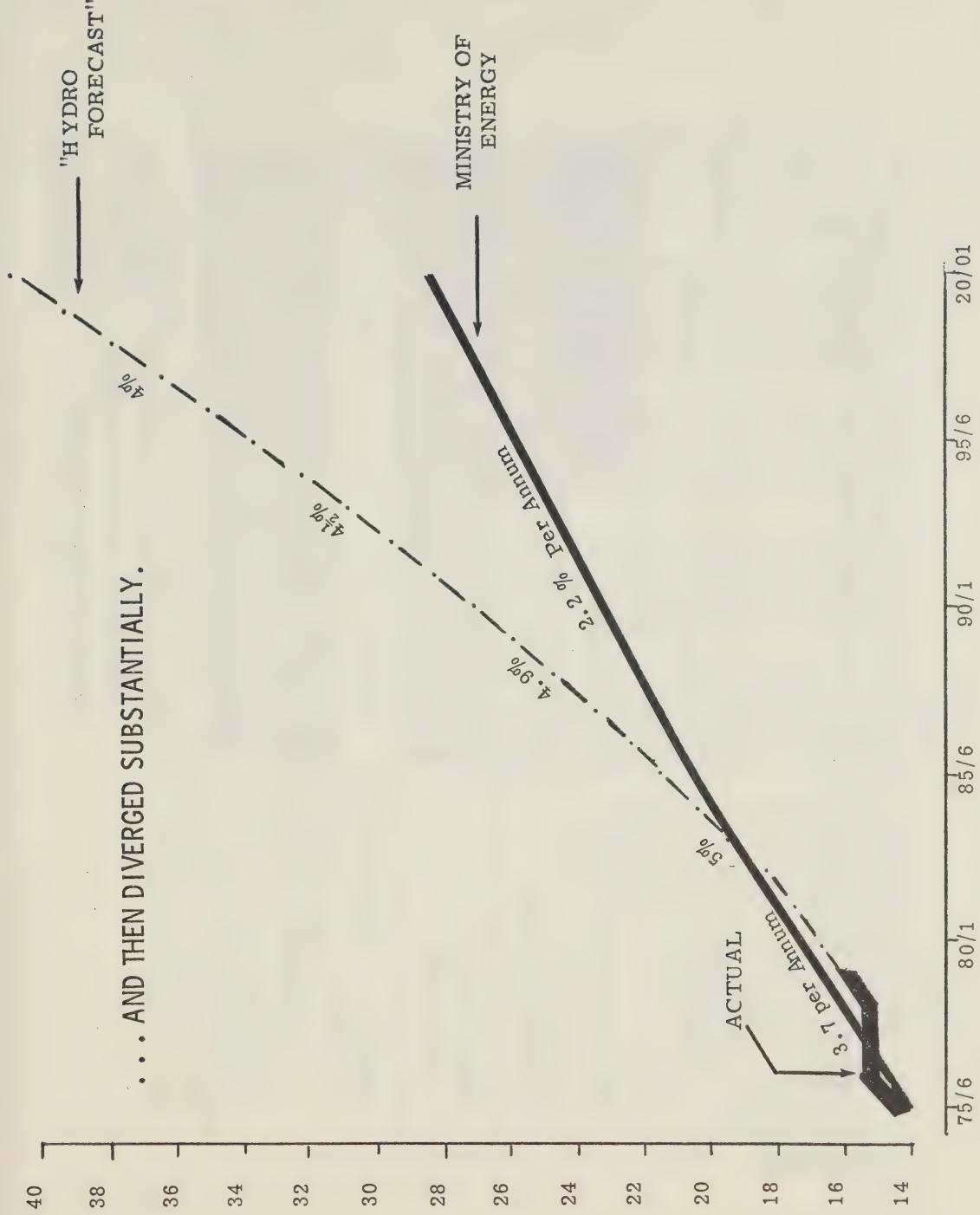
	<u>OLD SITUATION</u>	<u>NEW SITUATION</u>
Labour Force	2.25	1.5
Productivity	<u>2.25</u>	<u>2.0</u>
GNP	4.5	3.5
"Energy Multiplier"	$\approx$ <u>1.0</u>	$\approx$ <u>0.5</u>
Energy Growth	$\approx$ 4.5	$\approx$ 2.0
Electric Growth	$\approx$ 6.5	?

IN MARCH WE FORCUED ON THE ONTARIO PROJECTIONS OF HYDRO AND THE  
MINISTRY OF ENERGY

... THEY PRODUCED REMARKABLY SIMILAR RESULT TO 1985 . . .



... AND THEN DIVERGED SUBSTANTIALLY.



IN THE MEDIUM TERM - TO 1985 - THE DEVIATIONS OF BOTH PROJECTIONS  
 FROM THE CONSENSUS OF THE EVIDENCE PRESENTED TEND TO OVERSTATE  
 ELECTRIC ENERGY NEEDS

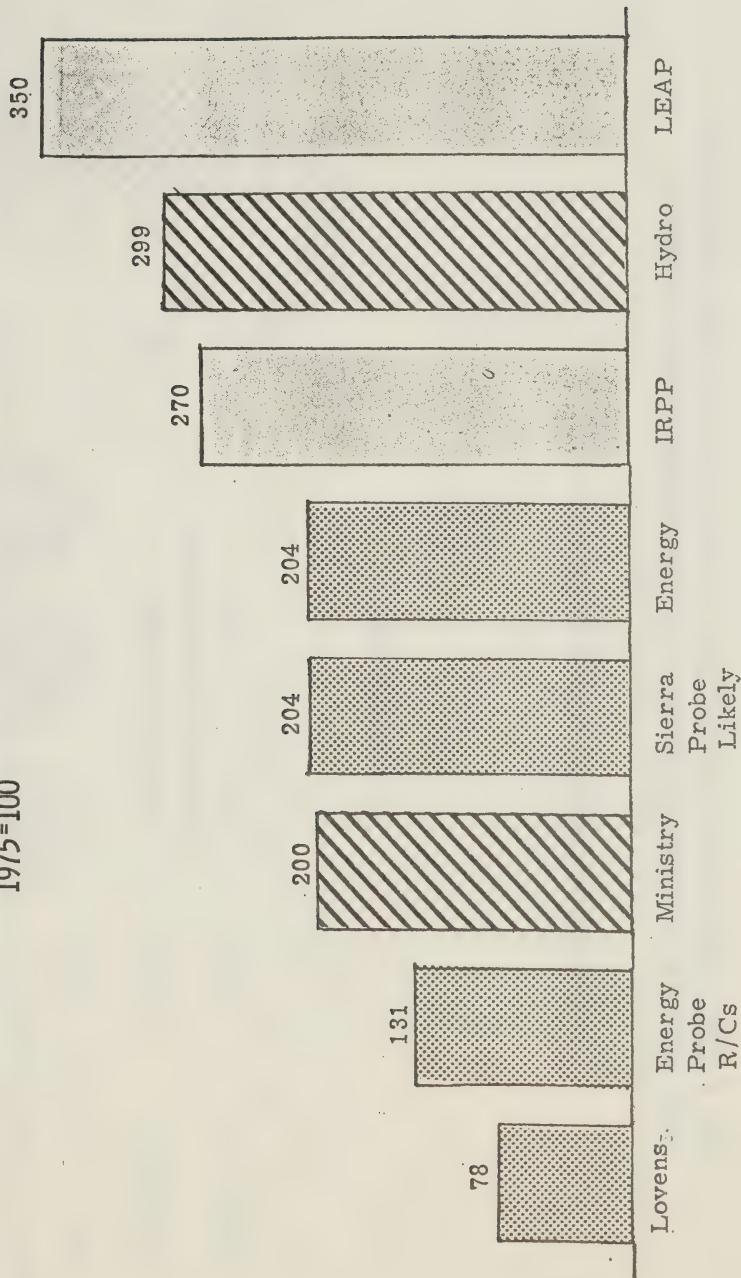
FACTOR	HYDRO	MINISTRY
DEMOGRAPHICS	Neutral	Lower
ECONOMIC GROWTH	Higher	Lower
INDUSTRIAL STRUCTURE	Lower	Lower
ENERGY SUPPLY	-conventional -alternative	Neutral Lower
CONSERVATION	Lower	Lower

Higher
Neutral
Lower

Effect of changing the assumption  
 to the consensus of the evidence  
 would be to make projection

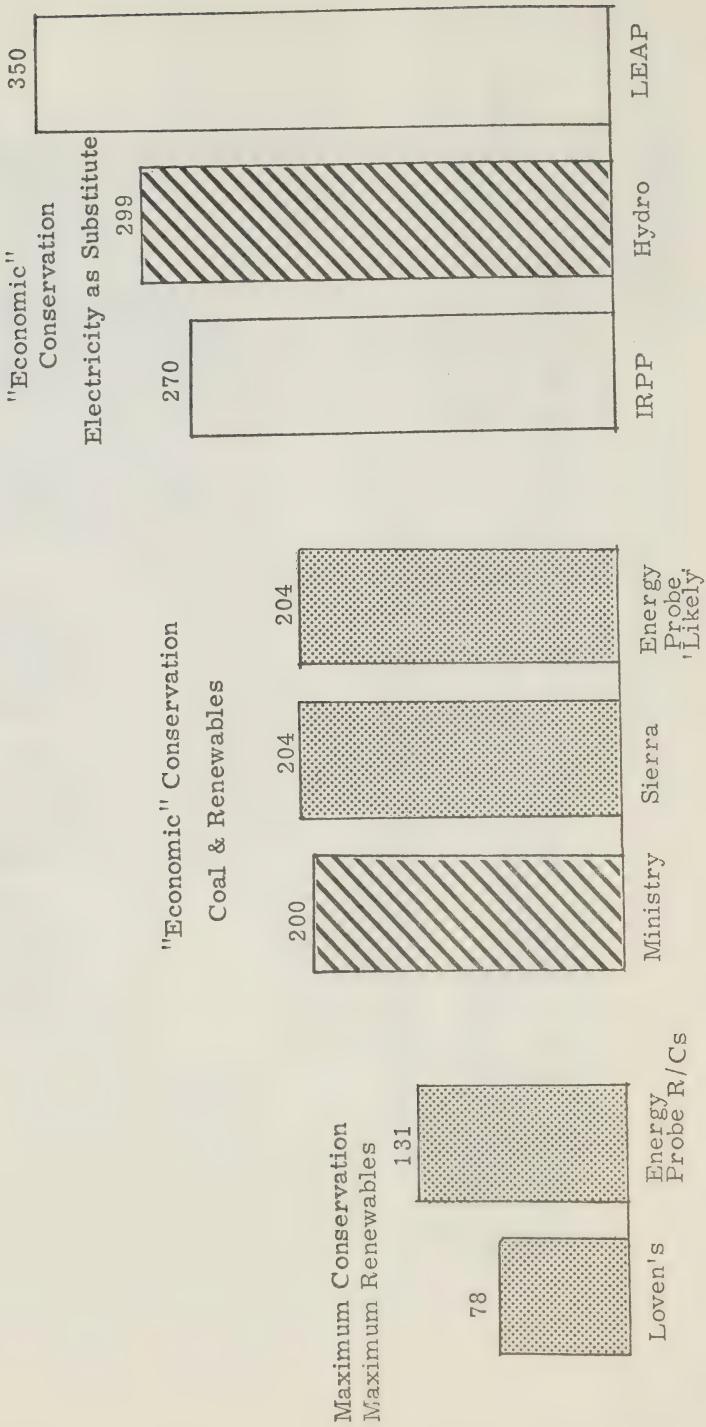
AND IN THE LONGER TERM, AGAINST SIX OTHER PROJECTIONS PRESENTED TO THE COMMITTEE, THE MINISTRY'S PROJECTION IS ABOUT IN THE MIDDLE AND HYDRO IS ON THE HIGH SIDE

Electricity Consumption in 2000 compared to 1975  
1975=100



BUT A MORE IMPORTANT PERSPECTIVE IS THAT THE MINISTRY AND HYDRO HAVE IMPLICITY FITTED THEMSELVES INTO DIFFERENT POLICY GROUPS

- Electricity consumption in 2000 compared to 1975



THE SPECIFIC PROJECTIONS THAT WE COULD ANALYZE ARE BUILT ON DIFFERING  
 ASSUMPTIONS . . . OF ENERGY REQUIREMENTS . . .

	CANADA			ONTARIO		
	LEAP (1975-2000)	IRPP (1975-2000)	NEB (1978-2000)	MOE (1975-2000)	OH (1980-2000)	RCEPP (1975-2000)
GNP	3.4	3.5	3.6	4.3	3.6	4.0
'Multiplier'	0.6	.57	.83	.49	Not Specified	.5
Energy	2.8	2.0	3.0	* 2.1	Not Specified	2.0

% growth to 2000

• • • AND ENERGY SUPPLY . . .

- Changes in share of energy markets for years indicated

	CANADA			ONTARIO		
	LEAP (1975-2000)	IRPP (1975-2000)	NEB (1978-2000)	MOE (1975-2000)	OH (1980-2000)	RCEPP (1975-2000)
Oil	-16	-28	-11	-6		
Gas	+ 1	-	-			
Renewables	+ 5%	+ 18%	+ 2%	-		NOT
Coal	+12%	-	-	+ 3%		SPECIFIED
Hydro and Nuclear	-	+10%	+ 9%	+ 3%		

E/22

Implied share change for Electricity	+ 12.5%	+ 10%	+ 9%	+ 3%	+ 9%
Required Annual Growth In Electricity	5.1% (capacity)	4% (energy)	4.3% (energy)	2.8% (energy)	4.5% (capacity)

# THESE SCENARIOS HAVE A GREAT DEAL OF IMPORTANCE TO ONTARIO HYDRO

POTENTIAL SUPPLY IS 1.65 TIMES TODAY'S NEEDS

REQUIREMENTS TODAY ARE:

1979 Forecast Demand	16,000 MW
25% Reserve	4,000 MW
Total	<u>20,000 MW</u>

PROSPECTIVE SUPPLY IS:

Capacity Today	23,698 MW
Plus committed	
Keith (1980)	256
Thunder Bay (1980-81)	310
Pickering B (1981-83)	<u>2,064</u>
Committed Supply	<u>26,328 MW</u>
Plus Not cancelled	
Atikokan (1984 & 1988)	400
Bruce B (1983-84 & 1986-87)	3,076
Darlington (1987-1990)	3,400
TOTAL POTENTIAL SUPPLY	<u>33,204</u>

NOTE: Figures shown are the revised ones submitted on November 15, 1979

AND THE QUESTION IS: HOW SOON WILL THE NEEDS CATCH UP TO THE SUPPLY

Average Annual Growth	Requirement In 2000 (000MW)	Year to Reach Potential Supply	Plants Required* Beyond Darlington to 2000
"Soft" Path	1%	25	2040
	2%	30	2004
"Mushy" Path	3%	37	1996
	4%	46	1992
"Hard" Path	5%	56	1989
			6

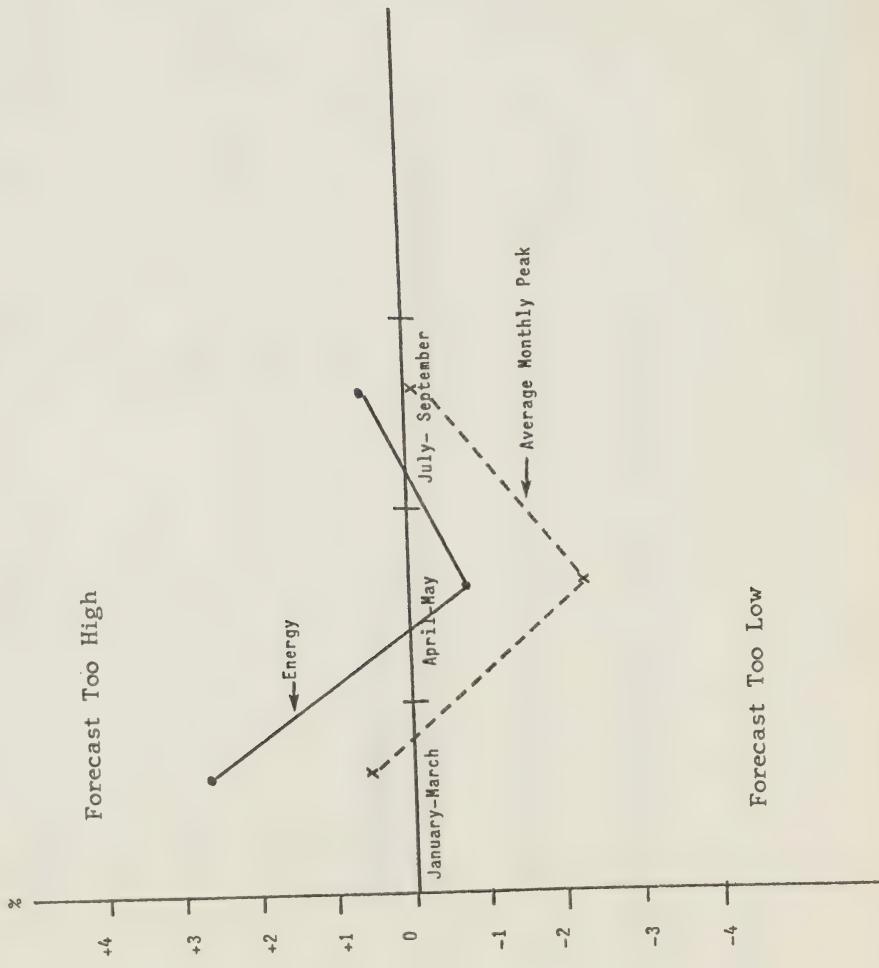
\* Approximated Darlington Sized

TWO MAJOR QUESTIONS HAVE ARISEN SINCE MARCH

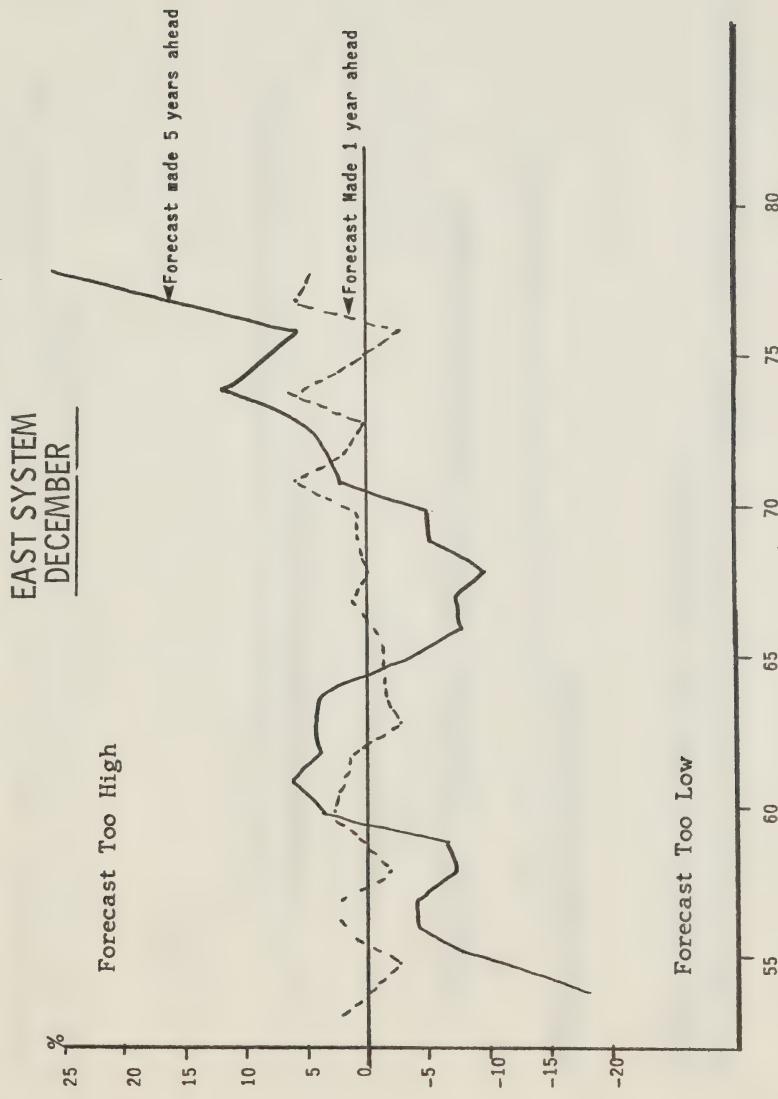
1. How is demand for electricity holding up this year?
2. Will electricity be needed in the future to substitute for declining oil supplies?

SO FAR, THE FORECAST FOR THIS YEAR LOOKS TO BE REASONABLY CLOSE

E/26



THIS IS TO BE EXPECTED . . . HYDRO'S ONE YEAR FORECAST IS ALWAYS QUITE ACCURATE



THE MORE DIFFICULT QUESTION IS WHETHER THERE IS A NEED FOR ELECTRICITY TO SUBSTITUTE FOR DWINDLING, EXPENSIVE OIL

THREE THINGS TO CONSIDER:

1. Hydro and Ministry assumption of substitution effects
2. Competitiveness of gas
3. Implication of Government policy

BOTH THE HYDRO FORECAST AND THE MINISTRY PROJECTION SHOW THAT  
ELECTRIC SUBSTITUTION WILL NOT BE A MAJOR FACTOR

### HYDRO

- Explicitly recognizes that oil and electricity are complements not substitutes

### MINISTRY

- Shows that "uncertain" oil future does not lead to more electricity

## A SECOND CONSIDERATION IS THE APPARENTLY IMPROVING PROSPECTS FOR GAS.

- Alberta Energy Resources Conservation Board officer estimated that Alberta gas reserves had doubled since the National Energy Board hearing in 1978

- Northern and East Coast announcements are promising

### ... WHICH IS REFLECTED IN ITS PRICE COMPETITIVENESS

	<u>NOW</u>	<u>POSSIBLE NEXT YEAR</u>	
	<u>Unit Price</u>	<u>Cost/mm BTU</u>	<u>Unit Price</u>
Electricity			
- Typical residential	3¢/kwh	\$8.79	3½¢/kwh
Oil			
- Heating oil	67¢/gal	\$4.02	80¢/gal
Gas			
- Typical residential	\$3.30/mcf	\$3.30	\$3.30/mcf*
			\$ 3.30

\* Approximately 71% discount from oil BTU basis if current price relationship approximates an 85% discount

NOTE: Figures shown are the revised ones submitted on November 15, 1979. Competitive comparison does not take account of higher end use efficiency of electricity

FINALLY, WE HAVE PUT TOGETHER THE IMPLICATIONS OF THE MOST RECENT STATEMENT OF GOVERNMENT POLICY - "ENERGY SECURITY FOR THE EIGHTIES"

### ITS MAIN FEATURES LEAD TO A VERY LOW GROWTH IN ELECTRICITY:

- Target energy growth 2%/annum
- Target oil consumption 0/capita growth, say 1.2%/annum overall
- Gas at 2% (3%)
- Goal for non-conventional renewables of 5% share by 1995  
(say, 5% in 2000)

THEN OUR ENERGY SUPPLY WOULD HAVE TO GROW 1.54 TIMES AND COME FROM THESE SOURCES. . .

	<u>1978</u>	<u>2000</u>	<u>Total</u>	<u>Average Annual</u>
Oil	45%	38	1.30	1.2
Gas	30%	30 (37)	1.54 (1.92)	2.0 (3.0)
Coal	10	10	1.54	2.0
Non-Conventionals	-	5	-	-
Electricity	15	17 (10)	1.73 (1.03)	2.59 0.15
	100%	100%		

NOTE: Figures shown are based on the revisions submitted November 15, 1979

## A STRONG LOGICAL CASE CAN BE MADE FOR A 2% to 2½% GROWTH

- Average energy growth 2% to 2½%
- Oil growth at NEB rate or less 1¼% to 1½%
- Gas growth at a little more than NEB rate
- Non conventionals growing to about 4% to 5% of needs by 2000
- Coal keeping its share

## THEN THE GROWTH IN ELECTRICITY SHOULD PARALLEL ENERGY GROWTH

Supply Today	2% Overall Energy		2½% Overall Energy	
	% Growth	New Share %	% Growth	New Share %
Oil	45%	38	1.5	36
Gas	30%	33	3.04	-9
Coal	10%	2.0	2.5	+4
Non-Conv.	-	-	-	-
Electric	15%	2.0	2.5	+5
		15	15	-
				100%

## SUMMARY AND MAJOR CONCLUSIONS

- § In March the Committee consensus was that the growth in demand was likely to be about 2% to 4% per year
- § Today, we believe that 2% to 3% Per year is a better range
- § This has serious implications for system planning - for Darlington and beyond

### THE DARLINGTON SCHEDULE CAN ONLY BE MAINTAINED ON A COST BASIS

- Cheaper than one of the current fossil plants
- OR AS A PROVINCIAL ECONOMIC PRIORITY
  - Maintaining jobs in current economic conditions
  - Keeping the nuclear industry alive
  - Providing "insurance" against other energy problems



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APPENDIX F

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LIST OF EXHIBITS

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## APPENDIX F

## LIST OF EXHIBITS

TABLED DURING THE HEARINGS INTO THE NEED FOR ELECTRICAL CAPACITY

<i>Exhibit #</i>	<i>Title</i>
D-1	"Developing a Perspective on the Demand for Electricity" Planning Presentation by the Staff to the Select Committee on Ontario Hydro Affairs
D-2	"Completing the Remaining Terms of Reference" Notes for a Briefing by the Staff to the Select Committee on Ontario Hydro Affairs
D-3	Summary Report The Implementation of Recommendations of the Select Committee Inquiring Into 1976 Bulk Power Rates
D-3A	Statement to the Legislature by the Honourable James Taylor, Q.C., Minister of Energy, re: Follow-up Action on the Recommendations of the Select Committee on the Legislature on Ontario Hydro's 1976 Rates
D-3B	A Report in Response to the Select Committee Recommendation III-1 - November 1977
D-3C	A Report in Response to the Select Committee Recommendation III-14 - November 1977
D-3D	A Report in Response to the Select Committee Recommendation III-17 and III-18 - November 1977
D-3E	A Report in Response to the Select Committee Recommendation III-19 - November 1977
D-3F	A Report in Response to the Select Committee Recommendation III-20
D-3G	A Report in Response to the Select Committee Recommendation III-21 - November 1977
D-3H	A Report in Response to the Select Committee Recommendation III-23 and III-24 - November 1977
D-3I	A Report in Response to the Select Committee Recommendation III-26 - November 1977

<i>Exhibit #</i>	<i>Title</i>
D-3J	A Report in Response to the Select Committee Recommendation III-27 - November 1977
D-3K	A Report in Response to the Select Committee Recommendation IV-8 - November 1977
D-3L	A Report in Response to the Select Committee Recommendation III-25 - November 1977
D-4	Ontario Population Projections - Presentation to the Select Committee on Ontario Hydro Affairs, Social and Economic Data Central Statistical Services, Ministry of Treasury and Economics, January 11, 1979
	Statistical Appendix, Social and Economic Data, Central Statistical Services, Ministry of Treasury and Economics, January 11, 1979
D-5	Population Projections for Ontario, 1976 - 2001, prepared for The Select Committee on Ontario Hydro Affairs by Population Estimates and Projections Division, Statistics Canada January 11, 1979
D-6	Ontario's Population and Labour Force to 2001 A Presentation to the Select Committee on Ontario Hydro Affairs by David K. Foot, Institute for Policy Analysis and Department of Political Economy, University of Toronto, January 12, 1979
D-7	Economic Forecasting, Presentation to the Select Committee on Ontario Hydro Affairs, Economic Policy Branch, Office of Economic Policy, Ministry of Treasury and Economics, January 16, 1979
D-8	Growth in the Volume of World Trade 1960 - 1990 (Real World Exports) presented by Dr. Jutlah
D-9	Thinking About Economic Growth, 1978 - 2000 Presented by Mr. M.C. McCracken, Informetrica, Ltd.
D-10	Letter to Mr. Alan Schwartz from Dr. Gordon Edwards, Canadian Coalition for Nuclear Responsibility
D-11	Regional Forecasting: An Econometric Approach, A Presentation by Data Resources of Canada for the Select Committee on Hydro Affairs: Ontario Legislature January 18, 1979

Exhibit #	Title
D-12	Memorandum from Dr. Gordon Edwards, Chairman, Canadian Coalition for Nuclear Responsibility to Members of the Select Committee of the Ontario Legislature
D-12A	Documents Dealing with Nuclear Safety (7)
D-13	News Release - from Atomic Energy Control Board, Nov. 28, 1978 re: AECB Releases Report on New Proposals for the Licensing of CANDU Nuclear Power Plants
D-14	Press Release - issued by Dr. Gordon Edwards, Chairman, Canadian Coalition for Nuclear Responsibility, re: changes in safety standards for nuclear power plants
D-15	Ontario is the Industrial Heartland of Canada; presentation from Ministry of Industry & Tourism.
D-15A	Statistical Database
D-15B	Summary Description of Databank for Ministry of Industry and Tourism
D-15C	Table 1: Variables Collected from Statistics Canada's Census of Manufacturing, Public, 1961-75
D-16	Letter to Mr. J.H. Jennekens, President, Atomic Energy Control Board from Donald C. MacDonald, Chairman, Select Committee on Ontario Hydro Affairs, January 24, 1979
D-17	The Weakest Link (Summary) A Technological Perspective on Canadian Industrial Underdevelopment by John H. Britton and James M. Gilmour, assisted by Mark G. Murphy
D-18	Absolute and Relative Employment in Ontario's Manufacturing Industry 1975
D-19	Points for Discussion - Michel Chevalier, York University
D-20	Notes on Government Industrial Strategy: A Missing Component is one of Micro-Demand Management, Jan. 3, 1978
D-21	The North Channel Needs Committee Submission to the Select Committee on Ontario Hydro Affairs Regarding Load Forecasting

<i>Exhibit #</i>	<i>Title</i>
D-22	Ontario Hydro: The Rising Cost of Power
D-23	Economic Impact of Nuclear Energy Industry in Canada, Executive Summary Leonard & Partners Ltd.
D-24	Submission by the Interested Citizens Group (cover page - Schematic Diagram of the Bulk Power Transmission System)
D-25	Where Canadian Oil Goes 1978 'First Half' Deliveries of Crude Oil Equivalent
D-26	Presentation on January 30, 1979 to the Select Committee on Ontario Hydro Affairs by Neil J. Duncan, P.Eng., Acting Manager, Coal Department, Energy Resources Conservation Board
D-27	Proposed Outline - "Long Term Supply Outlook for Alberta Oil and Gas" presented by Frank J. Mink, Manager, Coal Department, Energy Resources Conservation Board
D-28	News Releases from the Atomic Energy Control Board re: "AECB Releases Report on New Proposals for the Licensing of CANDU Nuclear Power Plants"
D-29	Statement by the Chairman, Inter-organizational Working Group
D-30	Proposed Safety Requirements for Licensing of CANDU Nuclear Power Plants, the Report of the Inter-organizational Working Group
D-31	Submission to the Energy Resources Conservation Board in the Matter of the Alberta Gas Ultimate Potential Proceeding No. 780491, Phase 1, by the Canadian Petroleum Association
D-32	Submission to the National Energy Board in the Matter of Canadian Natural Gas Supply and Requirements Order No. G.H.R.-1-78, 1978-09-01
D-33	Submission to the National Energy Board, Inquiry of May 24, 1978 for the Canadian Petroleum Association
D-34	Submission to the Energy Resources Conservation Board, in the Matter of the Alberta Gas Supply Protection Formulae, Proceeding No. 780491 Phase II

<i>Exhibit #</i>	<i>Title</i>
D-35	Forecast of the Supply and Requirements of Crude Oil, Synthetic Crude Oil and Pentanes Plus in Alberta, 1978-1995, April 1978 from Energy Resources Conservation Board, Calgary, Alberta
D-36	The Supply of and Demand for Alberta Gas, May, 1978 from Energy Resources Conservation Board, Calgary, Alberta
D-37	Availability and Desirability of Different Energy Forms and Technologies by Eliodor R.Q. Stoian, P. Eng., Science Council of Canada
D-38	Alternative Sources of Energy Supply, presented by Christopher J. Conway, Energy Probe, January 31, 1979
D-39	The Weakest Link A Technological Perspective on Canadian Industrial Underdevelopment, by John N.H. Britton, James M. Gilmour, assisted by Mark G. Murphy, Background Study 43, Science Council of Canada
D-40	Canada's Energy Opportunities, Report No. 23, Science Council of Canada March, 1975
D-41	Energy R & D, In Search of Strategy Ottawa, June 1978
D-42	Energy Planning in a Conserver Society - The Future's Not What It Used to Be, by Robert Crow, Peter Szegedy-Maszak, Christopher Conway, February 1978
D-43	Energy Planning in a Conserver Society, Implementation Strategies by Chris Conway, Robert Crow, Brian Marshall, David Brooks, January 1978
D-44	Sierra Club of Ontario Presentation to Select Committee on Hydro Affairs Conservation Enquiry - Feb. 6, 1979
D-45	Planning Electric Power for Ontario-Executive Summary
D-46	Planning Electric Power for Ontario, Sierra Club of Ontario, September 1978
D-47	Impact of Energy Conservation Measures on Ontario's Electrical Load Growth, prepared for the Sierra Club of Ontario

<i>Exhibit #</i>	<i>Title</i>
D-48	Discussion Paper No. 126, "Economic Impact of Low Energy Growth in Canada: An Initial Analysis" by David Brooks, Economic Council of Canada, Ottawa
D-49	"The Coming Boom in Solar Energy", reprint of article in Business Week, October 9, 1978
D-50	"Nuclear Dilemma" reprint of article in Business Week
D-51	Notes for appearance before the Select Committee on Ontario Hydro Affairs to discuss: "World Energy - Looking Ahead to 2020" A Report of the Conservation Commission of the World Energy Conference
D-51A	"World Energy: Looking Ahead to 2020" A Report of the Conservation Commission of the World Energy Conference
D-52	Presentation to the Select Committee February 7, 1979 by Middleton Associates, Research Consultants, Energy Resources and Environment
D-53	Energy Conservation Division, Ontario Hydro Report No. ECD-78-6 The Role for Load Management in Ontario, July 1978, Load Management Department
D-54	Part I - Overview and Load Management
D-55	Part II - Energy Conservation Ontario Hydro
D-56	Letter dated February 7, 1979 from Donald C. MacDonald, to the Honourable W.G. Davis, Q.C.
D-57	The Impact of Conservation and Interfuel Substitution on Electrical Load Growth, 1974-1993, Christopher J. Conway, Energy Probe
D-58	"Hydro Cuts Generation Program" - February 13, 1979 "Information from Ontario Hydro"
D-59	Analysis of Ontario Hydro's Excess Capacity - Bruce A
D-60	Analysis of Ontario Hydro's Excess Capacity - Nanticoke
D-61	Statistics Supplement, September 1978, Canada & U.S.A. Monthly Residential Electric Bills, July 1978

<i>Exhibit #</i>	<i>Title</i>
D-62	Rates per 100 KWh For Commercial and Industrial Use of 1,000 KW and 450,000 KWh
D-63	Potential Long Term Growth of Demand in the East System
D-64	Energy Futures for Canadians (Summary) by James E. Gander and Fred W. Belaire, Report EP78-2
D-64A	Energy, Mines and Resources Canada from the Office of the Minister "New Study Analyzes Canada's Energy Futures" February 9, 1979
D-65	Energy Futures for Canadians, Report 78-1 by James Gander and Fred W. Belaire
D-66	Letter dated February 14, 1979 from Donald C. MacDonald to the Honourable James A.C. Auld, Minister of Energy, re: Government policy regarding the export of electric power by Ontario Hydro
D-67	"Canadian Energy The Next Twenty Years: An Executive Summary" by Richard Clayton
D-68	Electrical and Electronic Manufacturers Association of Canada - Presentation to the Select Committee on Ontario Hydro Affairs of the Ontario Legislature - "Factors Affecting Planning for Electrical Generating Capacity to the Year 2000"
D-69	"Capacity of Canadian Capital Markets to 1983", Wood Gundy Ltd., February 1979
D-70	"Canadian Investment and Savings to 1990 (\$ Billion)", Department of Economic Research, Toronto Dominion Bank
D-71	"Conventional Energy Supply and Demand Panel" submitted by the Ministry of Energy to the Select Committee on Ontario Hydro Affairs, February 21, 1979
D-72	"Status of Actions Relating to the 1976 Recommendations of Energy Conservation and Load Management" submitted by the Ministry of Energy to the Select Committee on Ontario Hydro Affairs, February 21, 1979

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D-72A	"Pep Talk" editorial entitled "Have you read any good labels lately?" published by CSA Steering Committee on the Performance of Electrical Products (SCOPEP)
D-72B	Measures for Energy Conservation in New Buildings, 1978 - issued by the Associate Committee on the National Building Code, National Research Council of Canada, Ottawa
D-72C	A Study of the Relative Merits of Bulk and Individual Electrical Metering for Apartment Buildings in Ontario, prepared by a Committee Representing Ontario Hydro, Ontario Municipal Electric Association and Association of Municipal Electrical Utilities (of Ontario)
D-72D	Government of Ontario Energy Projects 1978/79, Coordinated by the Ministry of Energy
D-72E	Development of Industrial Co-generation in Ontario, ECD078-8, produced by Ontario Hydro
D-73	Energy Conservation and Renewable Energy Panel, Parts I and II: Part I - Conservation
D-74	Energy Conservation and Renewable Energy Panel, Parts I and II: Part II Renewable Energy, issued by the Ministry of Energy, Feb. 21, 1979
D-75	Substitution of Electricity for Oil Products and Natural Gas, submission to the Select Committee on Ontario Hydro Affairs, February 23, 1979, by the Ministry of Energy
D-76	Energy Demand Models Panel, Submission to the Select Committee on Ontario Hydro Affairs, February 23, 1979 by the Ministry of Energy
D-77	Long Range Financial Projection, 1978-1998, issued by the Ontario Hydro Finance Branch, Comptroller's Division 781201
D-78	Letter to Mr. Donald MacDonald, Chairman, Select Committee on Hydro Affairs, dated February 22, 1979 from James A.C. Auld, Minister of Energy, re: Government policy on export of electrical power

<i>Exhibit #</i>	<i>Title</i>
D-79	"Overview and Economic Outlook", presentation by Dr. D.A. Drinkwalter to the Select Committee on Ontario Hydro Affairs, February 27, 1979 from Ontario Hydro
D-80	"End Use Analysis" presentation by L.V. Skof to the Select Committee on Hydro Affairs, February 27, 1979 from Ontario Hydro
D-81	"1979 Load Forecast" presentation by L.T. Higgins to the Select Committee on Ontario Hydro Affairs, February 27, 1979 from Ontario Hydro
D-82	Long Range Electricity Forecast for Canada - A Methodology, Final Report November 1978, prepared for the Canadian Electrical Association
D-83	Economic Outlook, Economic Projections and Services Group, Economics Division, October 16, 1978 - Ontario Hydro
D-84	Economic Outlook - Quarterly Review, January 1979
D-85	Letter from J.P. Dobson, Manager, Public Hearings Department, Ontario Hydro to Mr. A. Schwartz, Committee Counsel, dated February 21, 1979 with attachments entitled "Design Adequacy of Hydro's Major Transmission Systems"
D-86	"The Electrical Energy Situation in Northwestern Ontario and the Need for the Completion of the Atikoken Generating Station" - presentation to the Select Committee on Ontario Hydro Affairs by the Township of Atikoken
D-87	Status of Action Relating to the 1976 Select Committee Recommendation III-1 February 28, 1979
D-88	Electrical Load Growth Forecasts, British Columbia Energy Commission, January 16, 1979
D-89	Review of Alternative Generation Programs, Ontario Hydro

<i>Exhibit #</i>	<i>Title</i>
D-90	Letter to Robert Taylor, Chairman, Ontario Hydro from Gertrude E. Gray, Deputy Clerk, Corporation of the Town of Newcastle, dated February 26, 1979 re: Darlington Generating Station
D-91	Power Purchases and Sales Outside Ontario, submission by Ontario Hydro January 1 to December 31, 1977
D-92	Power Purchases and Sales Outside Ontario, Submission by Ontario Hydro January 1 to December 31, 1978
D-93	Presentation by delegation from Bruce County - compendium of statements
D-94	Statement of the Council of the Town of Newcastle to the Select Committee on Ontario Hydro
D-94A	Clipping entitled "Hydro: Have More Foresight!" by Ralph Lampe
D-95	A release from Ontario Hydro entitled "Hydro Board Defers Decision on Plants"
D-96	A Preliminary Perspective on Future Growth in Electric Capacity in Ontario - presentation from the Staff to the Select Committee on Ontario Hydro Affairs
D-97	1978 Review of System Expansion Plan, April 1978 Ontario Hydro
D-97A	Supplement to 1978 Review of System Plan, April 1978 Ontario Hydro
D-98	System Planning Division Cost Comparison of 4 X 750 MW Fossil-Fuelled and 4 X 850 MW Candu Nuclear Generating Station Report No. 584SP January 1979, Ontario Hydro
D-99	Projected Total Unit Energy Cost M\$/KWH; Projected plant costs to 1993.
D-100	Year by Month Summary Power Systems Operations Division

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D-101 Focus on the Need for Electrical Capacity  
Presentation from the Staff to Select Committee  
on Ontario Hydro Affairs, March 28, 1979

D-102 Economics of Industrial Cogeneration of Electricity,  
Proceedings of Seminar Cosponsored by the Ontario  
Ministry of Energy and Ontario Hydro, December 13-  
14, 1978, Toronto, Ontario.

D-103 1. Reference: Transcript Sections HA-10254 and  
HA-1025-2 of February 12, 1979 between Mr. Foulds,  
Mr. Pinnington and Mr. Lundeen

D-104 System Expansion Program Reassessment Study, Final  
Report, Feb. 1979, Ontario Hydro

D-104A System Expansion Program Reassessment Study First  
Interim Report, Engineering & Financing Studies of  
Scenarios Based on the Official 1977 Load Forecast,  
November, 1978, Ontario Hydro

D-104B System Expansion Program Reassessment Study Second  
Interim Report, Reliability Studies of Scenarios  
Based on the Official 1977 Load Forecast, November,  
1978, Ontario Hydro

D-104C System Expansion Program Reassessment Study Third  
Interim Report, Socio-Economic Studies of Scenarios  
Based on the Official 1977 Load Forecast, November,  
1978, Ontario Hydro

D-104D System Expansion Study, Reassessment Study Fourth  
Interim Report Engineering & Financing Studies of  
Scenarios Based on a Low Load Growth Projection,  
October, 1978, Ontario Hydro

D-104E System Expansion Program Reassessment Study Fifth  
Interim Report, Reliability Studies of Scenarios  
Based on a Low Load Growth Projection, November,  
1978, Ontario Hydro

D-104F System Expansion Program Reassessment Study Sixth  
Interim Report, Socio-Economic Studies of Scenarios  
Based on a Low Load Growth Projection, November,  
1978, Ontario Hydro

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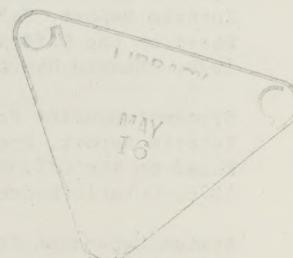
D-105 The Need for Electrical Capacity - Review and update of material presented to Committee January to March, 1979 - Select Committee on Ontario Hydro Affairs, October 24, 1979

Formerly E-111

D-105A Additions and Corrections to D-105 (Formerly Exhibit E-111), The Need for Electrical Capacity presented October 24, 1979

D-106 First Draft - Select Committee on Ontario Hydro Affairs on the Need for Electrical Capacity, prepared by Alan Schwartz, Counsel and James Fisher, Consultant

D-107 Letter dated November 15, 1979 to Mr. D.C. MacDonald, M.P.P., Chairman, Select Committee on Ontario Hydro Affairs from A. Niitenberg, Vice-President, Power System Program, Ontario Hydro, Re: Load Forecasts





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